NATURE MAGAZINE

AUGUST 1924

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THE TREE PLANTING ARMY

The tree planter of today has vision. By looking ahead fifty years he will help his community to have vision also.
—Charles Lathrop Pack, President, American Tree Association.

Now is the time to make your plans for the fall tree planting. If your club, school or town has such plans in view you should send at once for the American Tree Association planting suggestions, tree-day program and application blanks. The placing of a tree is most important. In many communities a suitable program is a task for the tree-planting committee. This the American Tree Association is ready to provide. Thousands this fall will join the tree-planting army and celebrate the centennial of Arbor Day in 1927 by planting trees.

California has planted 60,000 trees along her highways under the direction of W. E. Glendining, who cooperated with civic organizations.

At Altoona, Pa., the Col. John Proctor Chapter of the D. A. R. has planted two memorial trees.

The Woman's Civic Club of Springfield, Oreg., has taken up tree planting for the entire town.

New Jersey Elks, Trenton Lodge and Weehawken Lodge, have planted memorial trees and registered them with the American Tree Association.

Members of the Triangle Club of Kansas City have planted two miles of the Blue Ridge Road in memory of the men in the World War from Jackson County.

The first two Wilson Memorial Oaks have been planted on the Old Hickory Highway at Asheville, N. C. This inaugurated the planting of that highway and was followed by the planting of six memorial trees in front of the Fairview School on the Wildcat Highway.

R. G. Peters, of Manistee, Mich., planted a tree on the grounds of the First Congregational Church there in memory of Oberlin College which he attended seventy years ago.

Registrations of tree planters are coming in quantities from Pittsburgh, Pa., where the Kauffman Store gave away thousands of trees to the people of that city.

On the grounds of the famous Schuyler Mansion, the Mohawk Chapter of the D. A. R. has planted a memorial tree at Albany, N. Y.

In honor of the first president of the organization, Mrs. Merton A. Elsbree, the New Boston Woman's Club planted a memorial tree for her on the club's grounds.

Scout Troop T of Stottville, N. Y., has planted 1,500 white pines, this being the inauguration of a municipal forestry movement in that state.

"Old Glory" Chapter of the D. A. R. of Franklin, Tenn., has planted a memorial tree in honor of Woodrow Wilson.

The Waterloo Woman's Club of Waterloo, Iowa, has planted a memorial tree for the soldiers who did not return.

Montana Improvement Clubs, through their president, Hugh D. Page, report the planting of trees in many towns throughout that state.

Officials of the West Texas Chamber of Commerce have planted a tree on the campus of the high school at Brady.

Under the direction of the Shade Tree Commission, Mrs. B. C. Duvier, the secretary, reports the planting of trees at South Amboy, N. J., and 24 registrations in the American Tree Association.

One of the biggest tree plantings reported to the American Tree Association is from The Dalles, Oreg. Fifteen miles of highway between that town and Pendleton have been planted with trees by the schools of Hermiston, Echo, Umatilla, Boardman, Irrigon, Rufus. The Dalles Kiwanis Club started the tree planting along the famous Columbia River Highway two years ago. The Sherman Highway is also being planted.

The Woman's Club of Womelsdorf, Pa., took up the beautification of school grounds there and provided trees for the school children to plant at each school.

The Constantine Commercial Club has voted to cooperate with the Woman's Club in planting memorial trees along the highways out of that Michigan town and marking historic spots.

Prince Gelasio Caetani, Italian Ambassador to the United States, planted a tree on the Memorial Highway out of Seattle in honor of the Italian soldiers of the World War.

The only way to join the American Tree Association is to plant a tree and register it with the Association, 1214 Sixteenth Street N.W., Washington, D. C. The Association will send tree-planting suggestions and a tree-day program for two cents to pay postage. Make your fall tree-planting plans now.

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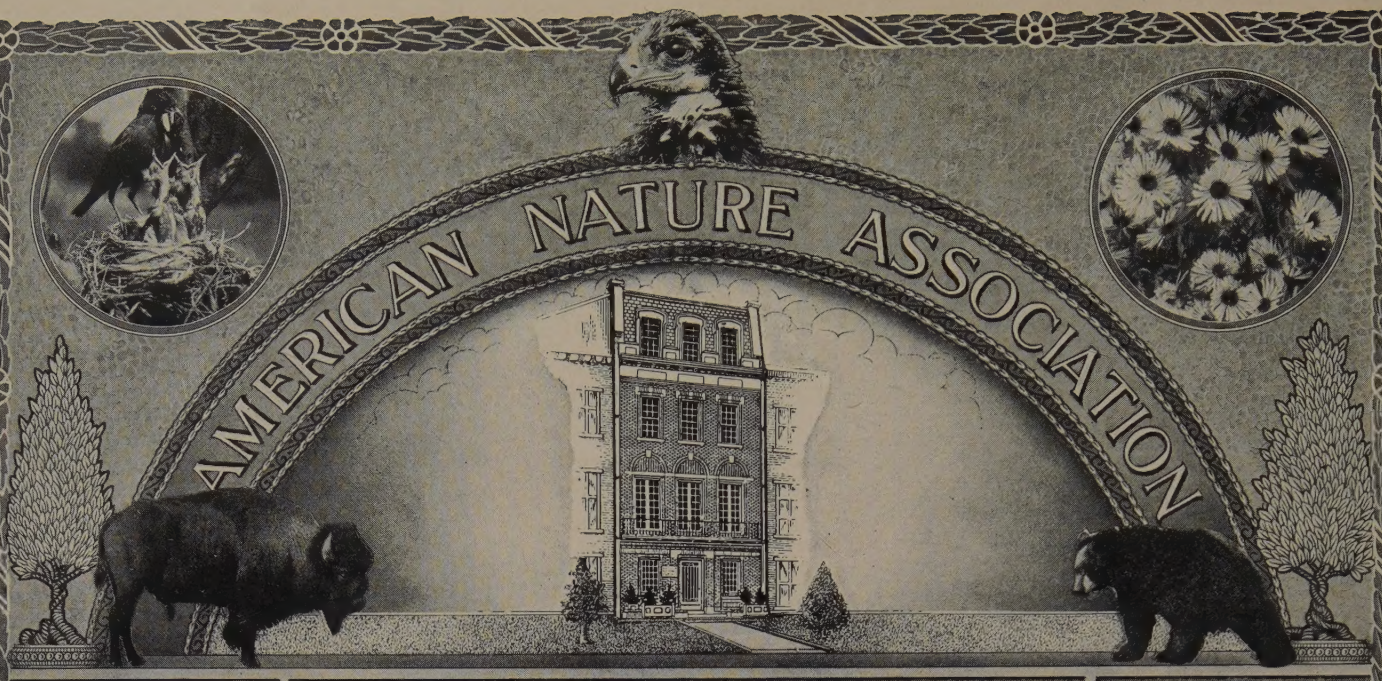


WASHINGTON, D. C.

Organized to stimulate public interest in every phase of Nature and the Out of Doors, and devoted to the practical conservation of the great Natural Resources of America

Officers

CHARLES LATHROP PACK, PRESIDENT — PERCIVAL SHELDON RIDSDALE, TREASURER — ARTHUR NEWTON PACK, SECRETARY

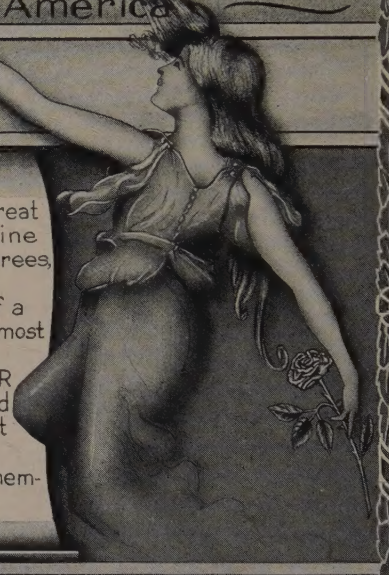
NATURE MAGAZINE

AT LAST, an adequate meeting-place has been provided for the Fraternity of the Great Outdoors. NATURE MAGAZINE has come in answer to a long-felt want - a monthly magazine where the child and the grown-up alike may revel in pictures and stories of birds, trees, beasts, fish, plants and other living, breathing evidence of the Creator's handiwork.

To every man, woman and child who thrills to the chirp of birds, to the friendly wag of a dog's tail, to the woodsy tang of cool, wet moss and the soft rustle of wind through the topmost branches of leafy trees, NATURE MAGAZINE will be a monthly treat.

You will find in NATURE MAGAZINE a publication perfectly attuned to YOUR nature, feeling the things that you feel and expressing your thoughts. You will find instruction through the medium of entertainment. You will agree that here is not "just another periodical," but a publication with a real purpose.

You are urged to send your name and address at once, with $2.00 for membership in American Nature Association, including NATURE MAGAZINE. Subscription price to non-members is $2.50 a year.



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August

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August

Nature Calendar

AUGUST

Gardens are now a riot of flowers with hosts of Marigolds, Dahlias, Zinnias, Salvias, Hollyhocks, Poppies and Gladioli.

Patches of violet-blue Pickerel Weed may be found in the swamp.

Rose Mallow, too, is blooming.

"The Garden is an intimate and keeps
In touch with us, yet hath its own high moods,
And doth impose them on the mind of man
To shame his pettiness. So do I love
Its shimmering August mood keyed to the sun,
A harlequin of color, birds and bloom."
—*Gertrude Huntington McGiffert.*

The female Grasshopper is laying her eggs beneath the surface of the ground.

Argiope riparia spins a large round web among the grasses and low bushes of the meadow. The web is decorated with a silky zigzag band through its center.

The creeping vine of the Ground Nut trails brownish-maroon flower clusters through the tangled grasses of the meadow.

Clusters of New England Asters line the roadsides—rays of purple with a heart of gold.

Toward the end of the month the rings of florets on the Blue Vervain will be drawing near the end of the spike. This marks the close of their flowering season.

Elderberry bushes droop with their burdens of rich, ripe berries.

Early Golden-rod is blooming in the fields.

Wild Bergamot, with its magenta-purple flowers, adds another color-tone to the symphony of fields and roadsides.

In the deep moist wood or beside some still pond you may find the Cardinal Flower flaunting its flaming blooms.

The persistent, monotonous hum of the Cicada, coming from the top of a neighboring tree, drowns out the softer chants of other insects.

As night approaches, the Katydid, another instrumentalist, begins his serenade.

Pewees and Red-eyed Vireos, undaunted by the sultry heat of August days, are still in song.

The older generation of the Io Moth have ceased parading and are spinning delicate cocoons among the leaves of the undergrowth.

Crickets are particularly well adapted to lending an appreciative ear to the playing of their mandolins. Their ears are placed most conveniently in the tibia of their front legs so that literally they hear with their elbows.

August is the month when birds are seen less than at any other time. It is their molting season.

During an early morning stroll you may see many different kinds of birds but their songs are seldom heard.

Nature has many protective devices. The Viceroy Butterfly, so like the American Monarch in appearance, is avoided by the birds even though it does not have the offensive taste of the latter.

Swallows, Red-winged Blackbirds and Bobolinks may be found in increasing numbers roosting among the reeds of the swamps.

The Sora Rail, too, is a frequenter of the marshes where ripening wild rice offers many a tempting feast.

The friendly little Wren is raising another family in the miniature dwelling in the garden.

The brilliant plumage of the Scarlet Tanager has become more subdued in color.

Prepared for NATURE MAGAZINE by the Cleveland Museum of Natural History

KILAUEA VOLCANO IN ERUPTION

The photograph shows a commencing stage of one of the terrific explosions, a mighty column of gas-charged smoke and flame surging upward to a height of twelve miles (see page 96).

NATURE MAGAZINE

Vol. IV AUGUST, 1924 No. 2

Both the body and mind of man are invigorated by habits of conversation with Nature.—EMERSON.

Trailing a Cougar to Get His Photograph

By WILLIAM L. AND IRENE FINLEY

Of the National Association of Audubon Societies

(PHOTOS BY THE AUTHORS)

THE NIGHT was crisp. All around lay the snow in white silence, a silence inexpressible, and found only in the heart of a great forest. The firs and pines stood like somber giants with their heads disappearing in the darkness above. The glare of the camp-fire lit up the lacy foliage of the encircling trees. There was no sound to jar the stillness save the crackling and spitting of the flames as they ate into the pitch pockets of the fir slabs.

I had been out five days following the trails with the hunters and the dogs in the hope of finding a cougar or mountain lion to photograph. We had pitched camp here on Pine Creek near where it empties into the middle fork of the Willamette well up in the Cascade Mountains of Oregon. It was the favorite hunting ground of Uncle Jasper Hills. Deer were plentiful. As the winter advanced, they were accustomed to come from the higher ridges where the snow is deep to the lower levels along the river where browse is abundant. The cougar follows the deer. Here we sat about the dying embers of the fire where we had been listening to hunting experiences of Uncle Jasper.

As I slipped quietly into my blankets, I could feel the presence of cougars. The silence of the night, the remoteness, this wild stretch of the forest, were enough. In the dark, a big mountain lion crept up near my bed of boughs. A shadow leaped to the crotch of the tree and lay stretched along the limb. But I was safe from his claws and teeth under the blankets of my imagination. Many a hunter has dodged under the bedclothes to safety and has lived to tell the tale of his narrow escape.

Early the next morning, Uncle Jasper, leading his

AN ETERNAL BOUNTY IS ON THE HEAD OF THE COUGAR

He is the enemy of game. The combined authority of state and federal government is bent toward getting rid of him. He is going down before a great campaign of expert hunters, dogs, guns, strychnine and steel traps.

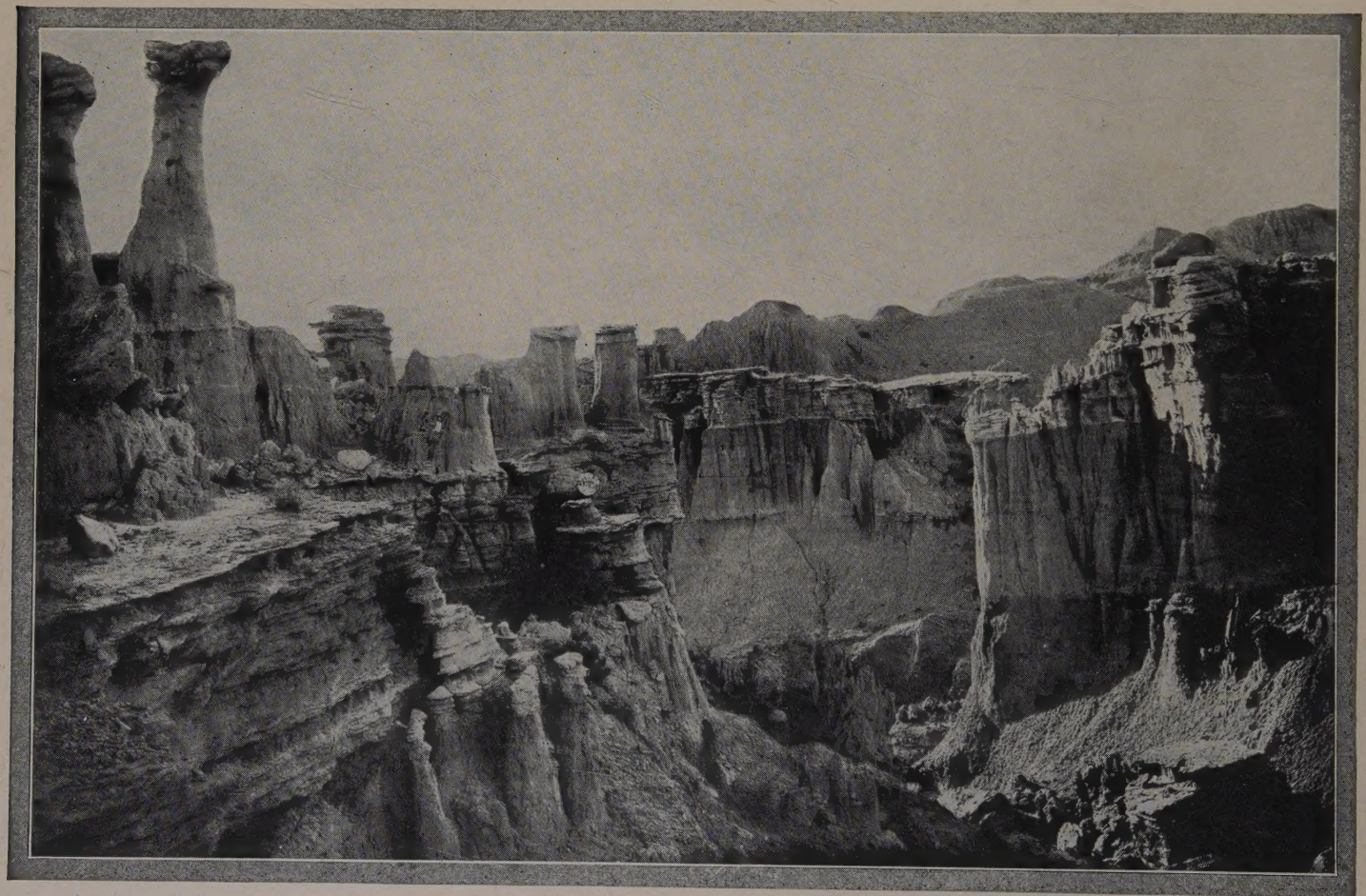
Throughout the world there are more than thirty thousand places at which the rainfall is measured every day by means of an instrument known as the *rain-gauge*. Thus there has been accumulated an enormous fund of rainfall statistics.

In English-speaking countries rain is generally measured in inches, and in the rest of the world mostly in millimeters. These measurements refer to the depth the rain would have if it all remained where it fell.

An inch is not a unit that suggests big things. When

THE RAIN-TREE OF THE ISLAND OF FERRO

Probably the "rain" shed by this celebrated tree was merely the moisture deposited on the leaves and branches by drifting fogs and clouds.



THE SCULPTURE OF THE RAINS

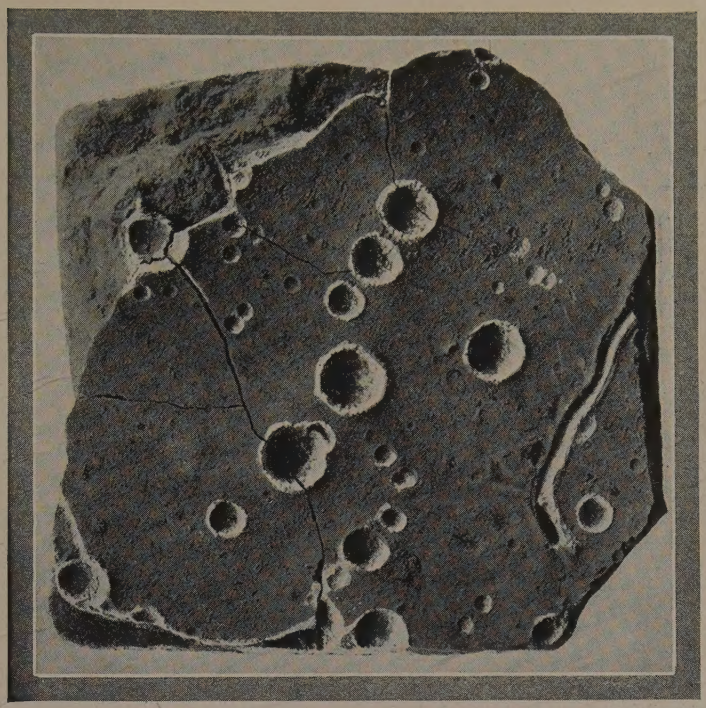
PHOTOGRAPH U. S. GEOLOGICAL SURVEY

Big Bad Lands of South Dakota. Occasional heavy rains produce these weird carvings in regions where the average rainfall is so light that there is little vegetation to protect the soil from erosion.

an astronomer speaks of a 100-inch telescope, the average layman does not suspect that he is talking about the most gigantic astronomical instrument ever constructed. So it is with rainfall figures. An inch of rainfall seems a trifling amount until we learn that it means 113 tons of water to the acre.

How much water do you suppose falls from the sky in a "torrential" rainstorm? The amount can be determined if the storm occurs where there are rain-gauges. In India, for example, where rain is a subject of absorbing interest and is measured at many hundreds of places, a single downpour, in the year 1880, deposited more than 7,000,000,000 *tons* of water over an area of 10,000 square miles. England is another country that is well supplied with rain-gauges; no other land has so many in proportion to its size. We may, therefore, accept with entire confidence the statement of English meteorologists that a single day's rainfall, in 1912, brought down 670,720,000 tons of water in the county of Norfolk—more than twice the volume contained in England's largest lake.

The rainiest parts of the world are on the slopes of mountains exposed to moist winds from the ocean. For



PHOTOGRAPH U. S. GEOLOGICAL SURVEY

RAIN-PRINTS

Formed in soft mud, which subsequently hardened. Although the above specimen is modern, identical records of the rains of millions of years ago are found in the rocks, helping to piece out the story of prehistoric climates.

THE THUNDERHEAD

PHOTOGRAPH BY LEWIS M'MURDIE

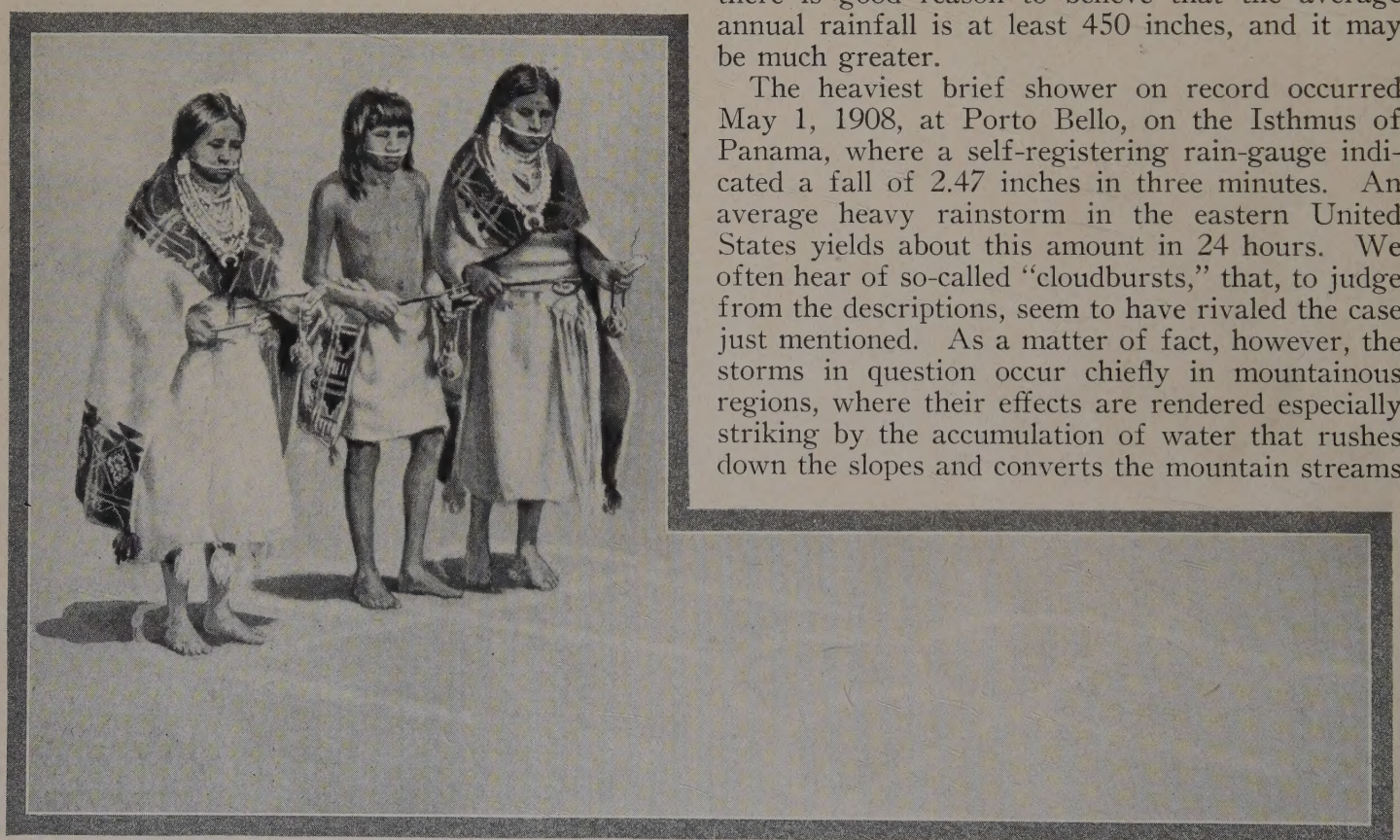
The high-piled cumulo-nimbus, with the usual illumination of sheet lightning at the base, is the most majestic cloud in all nature. It is the product of the rising air of a warm summer day, and as it forms it rears aloft until it seems to tower to awesome heights. The clouds in front are smaller cumuli which are showing their characteristic dark bases.

many years the little village of Cherrapunji, in the Khasi Hills of Assam, 4,100 feet above sea-level, enjoyed the reputation of being the wettest bit of "dry" land known to science. According to the latest official figures, its average annual rainfall amounts to 426 inches. Recently, however, a place has been found that appears, from the fragmentary record available, to be considerably wetter than Cherrapunji. This place is the wild and almost inaccessible summit of Mount Waialeale, in the Hawaiian Islands, with an altitude of 5,075 feet. Thanks to the combined activities of the U. S. Geological Survey and the U. S. Weather Bureau, a huge rain-gauge — the largest ever made—has been installed in this remote spot, and the present plan is to measure the rainfall and empty the gauge only once a year. A smaller gauge, formerly used at the same place, sometimes overflowed before it could be visited, and for other reasons the record thus far has been piecemeal, but there is good reason to believe that the average annual rainfall is at least 450 inches, and it may be much greater.

PHOTOGRAPH U. S. WEATHER BUREAU

"THE RAIN DESCENDED AND THE FLOODS CAME"

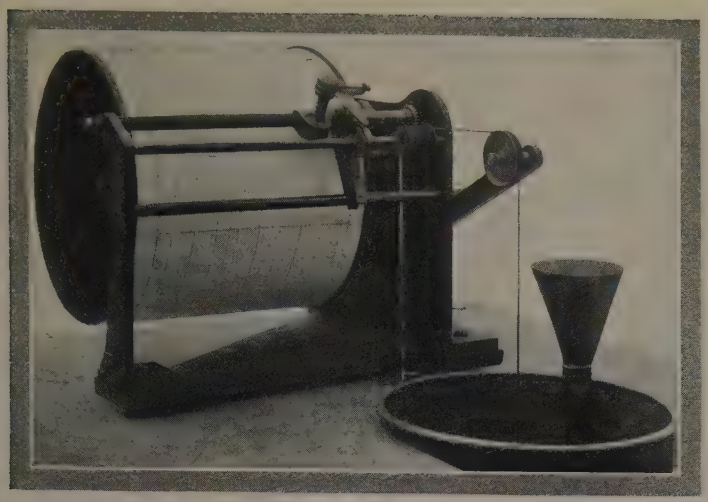
The heaviest brief shower on record occurred May 1, 1908, at Porto Bello, on the Isthmus of Panama, where a self-registering rain-gauge indicated a fall of 2.47 inches in three minutes. An average heavy rainstorm in the eastern United States yields about this amount in 24 hours. We often hear of so-called "cloudbursts," that, to judge from the descriptions, seem to have rivaled the case just mentioned. As a matter of fact, however, the storms in question occur chiefly in mountainous regions, where their effects are rendered especially striking by the accumulation of water that rushes down the slopes and converts the mountain streams



PICTURE FROM BUREAU OF AMERICAN ETHNOLOGY

A RAIN-MAKING CEREMONY AMONG THE HOPI INDIANS

"Flute" children throwing offerings on the rain-cloud symbols. (The semicircles represent clouds and the straight lines extending downward from them represent falling rain.)



PHOTOGRAPH U. S. WEATHER BUREAU

IT TELLS THE STORY OF A WEEK'S RAINFALL

Recording mechanism of the Marvin float rain-gauge. There are several other ingenious devices for the automatic registration of rainfall.

into raging torrents. This "funnel effect," so to speak, makes a rainstorm appear much more intense than it really is.

Probably the only parts of the world where it *never* rains are northern Greenland and the interior of the Antarctic continent, and both of these regions have plenty of snow; in other words, it is believed that no part of the earth is totally devoid of atmospheric "precipitation." There are, however, desert regions where whole years sometimes pass without a drop of rain.

The average rainfall of the globe as a whole is estimated to be about 60 inches a year. Its distribution is extremely uneven. While some countries get far more than they want, about 55 per cent of the total land surface has an average rainfall of less than 20 inches a year, and is, therefore, classified as arid or semiarid. Thus less than half of the land of the world is suitable for agriculture without irrigation or the special methods known as "dry farming."

One of the principal ways in which rainfall affects our pocketbooks is through its control of the crops. Moisture is, of course, essential to the existence of every plant, and one of the recent discoveries of science is that, for each kind of crop, there is a particular period in its development when it is especially responsive to the supply of this element. A famous example is furnished by Indian corn, or maize. Thus it has been stated that a difference of one inch (i.e., the difference between 4½ and 5½ inches), in the rainfall during July over the American "corn belt" means a difference of more than $400,000,000 in the value of the crop, at current prices.

Rain affects crops in another way besides supplying them with moisture. The atmosphere always contains nitrogenous substances that are valuable as fertilizers, and the rain washes them down in considerable quantities. The rain of tropical countries is especially rich in these substances. According to a French authority, M. Capus, the Tonkin delta in Indo-China, with its vast rice plantations, receives annually an amount of these atmospheric fertilizers that would be worth, at market prices, nearly 100,000,000 francs.

PHOTOGRAPH U. S. WEATHER BUREAU

THE COMMON RAIN-GAUGE

Standard type used by the U. S. Weather Bureau for measuring both rain and snow. When used for rain a conical receiver conducts the water into an inner tube of small diameter in order to magnify its depth and facilitate measurement.

So much for rain in the aggregate. What about rain as a process of Nature?

The French say, "Il pleut des hallebardes," and in English we often assert that it is raining cats and dogs, but the things that actually rain from the sky, under ordinary circumstances, are little drops of water, concerning which several interesting discoveries have been made. The drops begin their lives as cloud particles, after being formed by the condensation of the invisible gaseous water of the atmosphere. Once it was thought that these particles must be hollow, like soap bubbles, because they appear to float in the air, but this idea has been disproved. The drops do not actually float, but the speed with which they fall through still air depends upon their size, and the smallest drops fall very slowly indeed. A slight upward movement of air prevents them from falling at all.

It has been known for a good many years that every droplet in a cloud is formed around a central core or "nucleus" of something that is not water, and that is often described as "dust," though it has little in common with the dust that worries the housewife. These particles of so-called dust are mostly too tiny to be visible under a microscope, and some of them may be single molecules of gas. The drops in clouds have been measured (usually by noting their effects on light), and many are found to be from 0.0006 to 0.0008 inch in diameter. They must grow to a much larger size before they can fall as rain, and just how this comes about is a matter of some uncertainty.

A method of measuring raindrops is to allow them to fall into a shallow layer of fine, uncompacted flour. Each drop forms a little pellet of dough, which is found, by experiments with previously measured drops (produced for the purpose and dropped from various heights), to correspond very closely with the size of the drop. Mr. W. A. Bentley, who has measured and photographed hundreds of these raindrop casts, finds that they range in diameter from less than a hundredth of an inch to a quarter or even a third of an inch. This range in the size of the drops corresponds to a range in the rate of fall from about five feet a second for the smallest drops up to about twenty-five feet a second for the largest.

Raindrops that fell millions of years ago have left their impressions in the rocks. This has happened where the rain fell on a muddy surface, after which sand or some other light material drifted over it and filled up the little pits made by the drops. Finally both the mud and the overlying material hardened into rock, and today we find "fossil raindrops" which in some cases are the original pits and in others the casts of the material with which they were filled. The shapes of these "rain-prints" sometimes show clearly the direction from which the wind was blowing at the time of the prehistoric rainstorm.

Another sort of rain record, less ancient though dating back hundreds of years, is found in the annual rings of old trees, as revealed in cross sections of their trunks. Thick rings are supposed to have been formed during periods of abundant rainfall and thin rings when the rainfall was deficient, but as other things besides rain probably helped determine the thickness of the rings there is some doubt about how far this record can be trusted.

Rain has been the subject of many popular delusions—most of which contain some element of truth, or result from the misinterpretation of facts. For example, the newspapers are fond of telling us about a marvelous "rain tree," which sheds water from its leaves and which, according to the accounts published about it, would serve as a splendid substitute for irrigation in dry countries. The original rain-tree story appears to have come centuries ago from the island of Ferro, one of the Canaries, where a single tree was said to provide a supply of water for the whole island. Ferro is mountainous, and the uplands are frequently enveloped in drifting clouds, which deposit a great deal of their moisture on the trees and other vegetation. One or more large trees in the island may easily have caught enough of this moisture to furnish an occasional heavy drizzle under their branches, for the same thing happens today in other parts of the world. Moreover, in a moist atmosphere, especially in the tropics, it is not uncommon for trees to exude from their leaves and branches in liquid form a considerable amount of the water that they draw up from the soil, and this process—known to botanists as "guttation"—probably accounts for some of the similar stories that emanate from Peru and elsewhere.

Again, we read in the old chronicles and sometimes in modern narratives of showers of "blood." In most of these cases the rain was colored with reddish dust, sometimes blown up from deserts hundreds of miles distant. In other cases the supposed "blood" did not fall from the sky, but was due to the rapid multiplication in rain pools of various organisms containing red coloring matter. Showers of so-called "sulphur" consist of pollen, mixed with rain or otherwise, and generally coming from pine trees. Black showers are mostly colored with soot, and gray showers sometimes with volcanic ash.

The most persistent and widespread delusion about rain is that it can be produced at will by relatively simple operations on the part of mankind, or that it is produced unintentionally by such human agencies as cannonading in time of war, or (as was asserted during the protracted rains of the past spring and early summer) an excess of radio broad-

(CONTINUED ON PAGE 122)

THE DEER, STARTLED BY A SOUND

Full of inquiry and ready to bound away, over the snow-covered ground, if he believes that danger threatens him.

Actæon—A White-Tailed Deer

By ERNEST HAROLD BAYNES

Author of "Polaris," "Jimmie," "Wild Bird Guests," etc. Contributing Editor, "Nature Magazine"

(COPYRIGHT BY ERNEST HAROLD BAYNES)

IT WAS a warm May morning, and Forest Kimton, the guide, sat at his cottage window, oiling a rifle. Now and then he raised his eyes to scan the slope of Croyden Mountain, stretching north and south through the heart of the Blue Mountain Forest. Something out there caught his eye, for in the same instant he laid aside the rifle and took down a field glass from its hook on the wall. He saw a lithe, sinewy, white-tailed doe picking her way along a ledge of grey rock which jutted from the mountain side. Such a familiar figure would scarcely have held his attention but for the fact that the animal was behaving in a very unusual way. She would look behind her expectantly, turn and run back to a spot just out of view, advance again along the ledge and in evident anxiety return as before. Kimton replaced the field glass, opened the door and started up the mountain side.

When he arrived at the ledge the doe had disappeared, but he found a little spotted fawn lying in the grass just over the ridge. It arose on three legs; the fourth was broken below the hock. A narrow fissure in the ledge, with a few short, brownish hair clinging to one side of it, told the story. While following his mother the little fellow had stepped upon some leaves which hid the fissure, his leg had gone down, to be wedged between the narrow walls. The sudden jerk which freed the imprisoned limb had broken the delicate cannon bone, and at once he was bereft of half his tiny might. That was why he had lain down; that was why his anxious mother had run back and forth and attracted the

attention of the guide. Now he stood there, wide-eyed, trembling, and, crippled though he was, in another moment he would have made a frantic effort to escape. But the guide was used to the ways of wood folk, and with a single sweep of his strong arms he deftly captured the wild baby before him and carried it off lest it be devoured, perhaps that very night, by the first hungry fox or wild cat which chanced to pass that way.

Kimton returned to his cottage and placed the patient in a narrow wooden box, where most of the time it stood quietly, and where from time to time it was given milk from a bottle. The little fellow did not struggle nor attempt to use the broken leg, which hung down in an almost natural position. In a few days the broken ends of the bone had knit perfectly, and the little black hoof was allowed gently to touch the floor. Then Kimton took the fawn in his arms again, drove five miles over the mountain and delivered him to me.

At first we put him in the barn, where he occupied one of the stalls. We boarded it up to a height of four feet to resemble a "loose box." He was still rather lame and at once lay down upon a bed of hay which we had provided for him. When he got up again he seemed better, and, as he was hungry, he let us know it by bleating gently and by looking toward us eagerly, with most appealing brown eyes. When I held out to him a milk bottle, he knew from experience that it contained his food, yet, as he took the nipple, he punched me vigorously with his hard little head, just as he would have punched his mother had he been taking his dinner with her. We named him Actæon, and by that appellation he was known to all of us except the housekeeper, who always called him "Cuddy," a name suggested, I suppose, by the fact that after he began to graze and browse he spent much time in chewing the cud.

BELOW

READY FOR THE WINTER

A heavy grey-brown coat has replaced the thin, spotted one of his fawnhood days.

ABOVE

THE FAWN CONVALESCING

Note the swelling on the left hind leg, at the point where the bone was broken.

He was a wonderfully beautiful creature, and one never tired of looking at him. His glossy coat was reddish-brown in color, with striking white spots on the neck, back and sides. There was a white patch on the throat and a white stripe down either side of the neck. His legs, which were lighter in color than his body, were slender, sinewy and graceful, one of them only being slightly marred by a bunch of hard tissue around the point of fracture. But his most beautiful feature was his head. His large dark eyes were full of expression, and in combination with his shapely ears, which moved back and forth with every sound, showed pleasure, excitement, fear and other emotions, almost as plainly as a human face could show them.

The white spots, it would seem, were in the na-

ture of concealing coloration. Conspicuous as they were when he stood in the barn, when he lay down in a shadow on the edge of the woods he might easily have been mistaken for a patch of white flowers. And once when he stood in a field of ox-eye daisies his legs and body seemed to melt into the background, and the white spots formed one of the hundred patches of bloom which strewed the landscape. He was no longer a deer, but a part of the field he stood in.

His disposition was affectionate, and whenever he had a chance he would lick one's face and hands, making them feel as if they had received a coat of thin glue.

He had been with us only a few days when I found him trotting about the barn. I made inquiries to find out who had lifted him out of his stall. Apparently no one had done so, yet it seemed impossible that this baby, lately quite lame, should have cleared a four-foot barrier from almost a standstill. Yet he had done so, and when I put him back he proved it almost at once by leaping out again with an ease and grace which gave promise of marvelous performances when he should have attained his maximum powers.

Every morning now we took Actæon out for a run over the hills, using a bottle of milk to coax him back to the barn after he had had his exercise. Often he would run clean away from us and go on and on, until he disappeared over a ridge perhaps half a mile away. Sometimes he would be gone so long that we feared he would never return. Then someone would shout, "Here he comes," and we would see him coming like a brown streak, tail up and ears laid back, rising like a swallow at every rock and bush in his path, checking his speed as he approached us, breaking into a brisk, elastic trot, and finally slowing down to a walk just before he came up to thrust his moist muzzle into our hands.

Once he gave us a real "scare." He stayed away all day, and it was not until nightfall that he came bounding in, so hungry that he tried to swallow the bottle as well as the milk. If the dogs had scented him, his concealing coloration might not have been enough to save his life.

Once while he was still very young I saw the fawn display a very curious taste. I was cutting up raw meat for my wolves when Actæon sauntered up and, seizing a piece weighing a pound or more, carried it off and began to eat it. It was quite too much meat for a baby of that age, so I took it away from him, but when I offered him a few thin slices he ate them with surprising relish.

For a long time we fed the young deer chiefly on milk, the quantity of which was increased until he was taking three quarts a day. But as we gave him more and more liberty, and as he was thus able to pick up more food for him-

ABOVE

RISING TO THE OCCASION

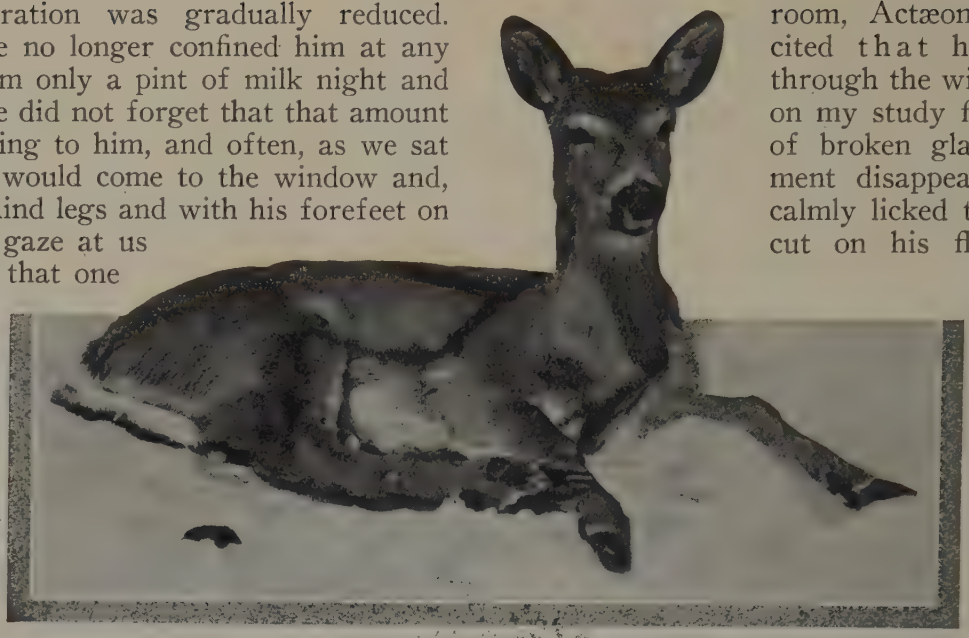
The time is September of the Fawn's first year. Note how his white spots have almost disappeared.

BELOW

NATURAL CAMOUFLAGE

Actæon in a field of daisies where his brown coat with white spots makes it difficult to distinguish him at a short distance.

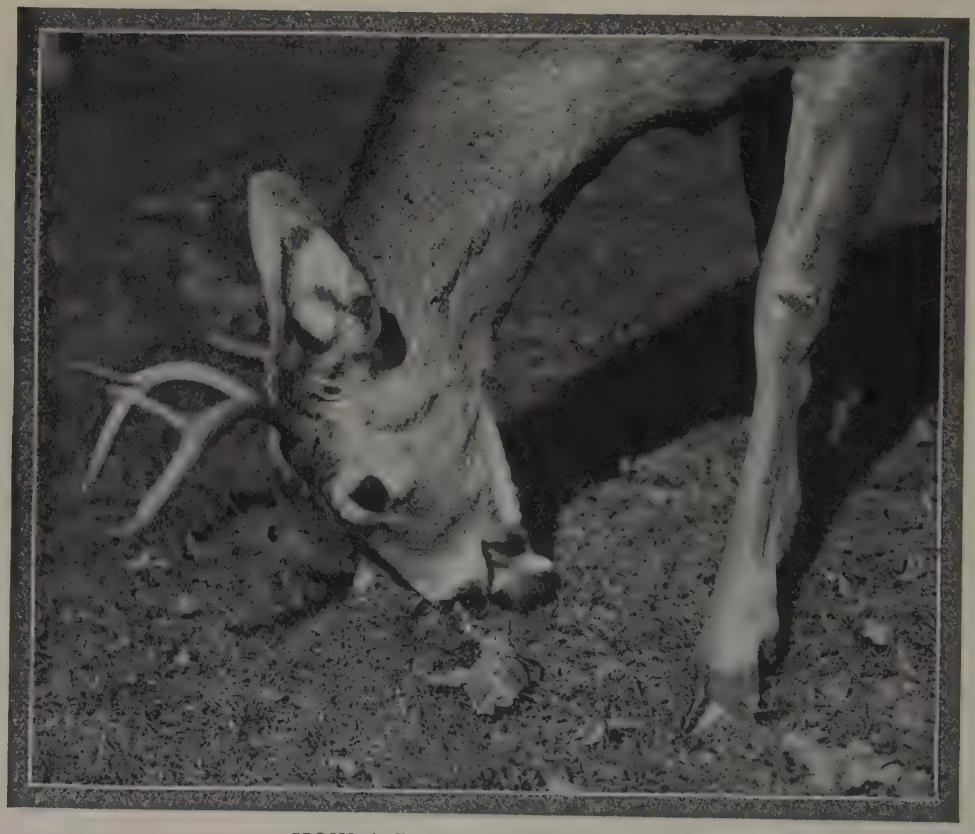
self, his milk ration was gradually reduced. Finally, when we no longer confined him at any time, we gave him only a pint of milk night and morning. But he did not forget that that amount at least was coming to him, and often, as we sat at breakfast, he would come to the window and, standing on his hind legs and with his forefeet on the window sill, gaze at us so reproachfully that one of us was sure to get up from the table to feed him.



ACTÆON LYING DOWN

Note the ease and grace of his attitude, with the forelegs extended somewhat like a dog.

With the coming of autumn the white spots on Actæon's coat began to disappear, and his thin reddish coat gave place to the much heavier one of greyish-brown which was to be his protection through the long New Hampshire winter. He still came for his milk rations, but after he had had them he would wander off to browse on the leaves of shrubs and low trees, to nibble the grass, or to pick up fallen apples, of which he was very fond. Very often he took a romp with other animals we had about the place, especially with the prairie wolf, Romulus, for the two were great pals and very evenly matched in speed and strength. A favorite game was to race the length of the long verandah, clearing the railings at the ends like race horses in a steeplechase. Once, when they were rough-housing just outside my room, Actæon became so excited that he leaped right through the window and landed on my study floor in a shower of broken glass. His excitement disappeared at once; he calmly licked the blood from a cut on his flank and then walked up to me to be petted.



HOW A DEER EATS AN APPLE

As it rested securely against his upper jaw, he sliced it with his lower teeth.

If he saw any of us setting out for a walk, he almost always wanted to go with us, and usually we let him. At such times he gave very little trouble. Unlike some of our other animals, he minded his own business and amused himself quietly in his own way. I remember very well our coming to the first pond he had ever seen. He showed the unaffected joy of a child having a delightful experience for the first time. The pond was shallow and he ran into it, pawing the water vigorously with his forefeet, at the same time lowering his head as if trying to get the full benefit of the shower bath he was creating. Then he would gallop through the pond, sometimes jumping right out of the water and coming down with a big splash. Once, as he frisked about, he lost his footing and fell down, the water going over his head. When he arose it was evident that he was

ACTÆON IN LATE SUMMER

The antlers are now in the velvet, as can readily be noticed by their soft and fuzzy appearance. They will now steadily grow harder.

not wet to the skin. Most of the water had rolled off, and the rest stood in drops on the hair and flew into the air when he shook himself. The experience seemed to give him renewed energy, for he set off on a run, going at top speed over hill and dale and clearing the stone walls and bushes as if he were competing in a cross-country race. When he was tired of this he trotted up to me, panting, open-mouthed, and I patted his neck, rubbed his ears and felt his horn pedicles, which were now two very decided lumps, one over each eye.

When winter came the young deer depended on us almost entirely for his food. Usually he slept in the orchard, quite at his ease even when the thermometer fell to twenty-five or thirty degrees below zero. Often we would look out of the window and see him lying under an apple tree in the falling snow; at least we would see his head, for the rest of his body might be completely buried. Sometimes his face would be sheathed in ice, and icicles would be hanging from his chin and eyelashes, but he would go on chewing the cud as calmly as a cow in a clover field on a summer evening. If we tapped on the window he would rise to his feet and stretch himself as if to take out the kinks. Then he would give his body a vigorous shake, sending the snow flying in every direction, and all brown once more he would come to the window and stand on his hind legs to reach a slice of bread held out to him.

In the early spring we decided to turn Actæon back into his native Blue Mountain Forest, and this was an easy matter, for the fence of this great game preserve ran along the edge of our garden, whence we could enter it by a gate. So, into the forest he went, and with him a goodly store of bread, potatoes and other things which a deer will eat, for the grass had not yet come up and he had little experience in foraging for himself. For some time he did not stray far from the gate, and every day he would come back partly in the hope of seeing us, perhaps, and partly to eat the food he knew would be waiting for him.

In May, when grass and browse were to be found on every hand, Actæon turned up his pretty nose at bread and potatoes and wandered far afield. It was seldom indeed that we saw him, and when we did, usually it was only to get a glimpse of him in the distance, and even then we were not always sure that it was he. But one day in July, when I was walking through the woods looking for an elk fawn, I caught a glimpse of red on the ground beneath a tree, and a moment later saw that it was a young buck deer. I dropped to the ground behind a knoll, and then, crawling to the top of it, I was able to examine him at leisure. One good look was enough to show me that it was Actæon. When one is really familiar with an individual animal, it is surprising how different it looks from others of its species. However much Actæon may have resembled his brethren when seen at a distance, I feel sure that, close at hand, I could have dis-

(CONTINUED ON PAGE 124)

A Wood Duck Adventure

By HOWARD TAYLOR MIDDLETON

(PHOTOGRAPHS BY THE AUTHOR)

JUST a stone's toss inland from the dreamy Rancocas, across lush meadows, sparkling like some rare jewel in a setting of emerald grasses, and rimmed also by stately willows and cedars and a lone wild apple tree, lies *my* "smiling pool."

At dawn and dusk during early May, a pair of dainty water fowl, the beautiful drake resplendant in a coat of bronze green, violet, maroon brown, and buff, with yellowish-red stockings, his consort more sedately garbed in dark drab and brown, were noticed upon the surface of the pool, while plaintive love notes of "Peet, peet, peet," were wafted away on the gentle breeze.

THE "SMILING POOL"

It was here that Madame Wood Duck nested in a wild apple tree.

Then they were seen no more until the time that Bossy, a lady bovine, rubbed her velvet neck against the wild apple tree to dislodge the gorging flies. Even though Bossy's contact with the tree was little more than a caress, it nevertheless proved most disturbing to Madame Wood Duck brooding her thirteen greenish-white eggs within the hollow trunk, and in testimony of her high displeasure, she flew forth almost in Bossy's face.

Now that the wood duck home was discovered, the writer immediately laid plans for a series of flight pictures, depicting the feathered aviatrix departing from her front doorway.

Knowing the speed of this swiftly flying bird to be no less than ninety feet per second, slightly more than a mile a minute, he realized that it would take keen eyes synchronized with a nimble trigger finger to register her fleeting image upon a photographic film.

In company with a reliable assistant, the next day found him primed for the adventure. With Graflex camera shutter set at 1/1,000 second, and the big lens open at f.4.5, he took a position at one side and slightly in front of the nesting hole, while Walt stood behind the tree, stick in hand. When all was in readiness, I nodded a signal and the stick tapped gently upon the trunk. The slight sound was echoed by a veritable whirlwind of fluttering pin-

WAITING FOR THE WORD

The nestling pictured here is a few days old and has been posed in the nesting hole.

ions, and, as soon as possible, the shutter was released.

We disturbed our subject no more that day for fear she might abandon her nest if interfered with too frequently, but the next bright morning found us once more triumphant in our quest for wood duck flight pictures. The photographer's wife being present at hatching time, one of the nestlings, fresh from the shell, was photographed upon her palm.

FRESH FROM THE SHELL
This little wood duckling was still wet when posed on a lady's palm.

Still another day, and the time for breaking home ties had arrived. Mother stood at the foot of the wild apple tree and called her twelve children softly—one egg did not hatch. In answer to her insistent pleadings, the fluffy babies rained down through the eight feet of space to hard earth, and why they were not killed, or even injured, is still a mystery.

WHIRLWIND PHOTOGRAPH OF WOOD DUCK
This bird flies at the rate of about a mile a minute and the camera shutter had to be set at 1/1,000 second to catch her.

THE WOOD DUCKLING QUARTET
They are on their way to a pasture after bugs and seeds and other good things.

In the short journey to the "smiling pool," the wood ducklings became separated, five swimming close in mother's wake, seven heading out toward midstream "on their own."

Whether or not the presence of the photographers was responsible for Madame Wood Duck's abandonment of the seven ducklings, who failed to cling to her apron strings, or, speaking literally, "tail feathers," I cannot say. The fact remains that she escaped to the Rancocas with five of her children, leaving seven orphans behind her.

Very fortunately, indeed, Senora Muskovy, that eccentric member of the duck tribe whose wild Spanish ancestors frolicked in the tides of the Amazon, and whose traits parallel closely those of the wood duck, had just descended from her willow tree nursery with a brood of twelve golden puff balls, and, forthwith, took the orphans to her heart.

I regret ex-

ceedingly that I am now forced to record the abrupt departure of three wood ducklings from the "smiling pool," and while my evidence is entirely circumstantial, I have seen both water snakes and snapping turtles within its crystal waters.

However, the quartette that still remains is waxing downright valiant by now—thinking nothing of brave pilgrimages to a neighboring pasture for bugs and seeds and all the innumerable delicacies that such a nature's storehouse affords.

More than a month has passed since their adoption by Senora Muskovy, and they seem to have become perfectly satisfied with their present environment. It will be most interesting to note whether, as they approach maturity, the "wild" in their blood will call them from the foster-mother across the lush meadows to the dreamy Rancocas where their true mother waits amid the ripening reeds. Will their budding wings be content to beat above the "smiling pool," or will the joys attending new-found flight urge them over a space too vast ever to return?

One interesting peculiarity in connection with the nesting habits of this beautiful water fowl is that she frequently takes up her abode very much farther away from nearest water than did the individual with which this story deals. Once upon a time the writer came upon a wood duck home in the midst of oak timber a mile or more inland from the Rancocas, and he also knows of a nest that was discovered under the eaves of a farmer's barn. It is easily understood that the keen appetite for acorns possessed by Lady Wood Duck was the lure that drew her to her housekeeping among the oaks, but what induced her to hatch her brood in a hay mow remains a mystery.

A NESTING MUSKOVY DUCK

This duck's habit of nesting in a tree resembles closely that of the wood duck.

Don't Forget to Turn the Film

Another rule to be memorized along with those already explained in this department, in the interests of better photographs, is that which emphasizes the necessity of turning the film after each exposure when taking Kodak pictures.

If this is not done, there will eventually come the time when, after procuring a priceless negative, it will be rendered worthless by double exposure—i.e., by another picture being taken upon the same film.

There are very rare instances when interesting, and sometimes even bewildering, effects may be obtained accidentally through double exposure.

But as the occasions when a worth-while picture can be procured through double exposure, either by accident or design, are exceedingly few, it is best to avoid such occurrences by always remembering to turn the film following every snap of your Kodak.

THE FOSTER MOTHER AND HER MIXED BROODS

After adopting the abandoned wood ducks she gave them all the care and attention she lavished on her own children.

Tannin for Strengthening Leather

By RICHARD W. WESTWOOD

HAVE you ever joined in a peanut hunt, peering behind pictures and into vases, searching in out-of-the-way places for the hidden peanuts? Nature staged the original peanut hunt. She had myriad things of value to man to distribute around for him to find and use. In the bark of some trees, in the heartwood of others, and in the leaves, twigs, nuts and fruit of still others she stowed away tannin.

Along came man with the hides of animals that decayed quickly by themselves. He needed something that would preserve and strengthen and color the hides that he needed to keep him warm and shod and supplied with many things. He went hunting and found tannin. According to history the Chinese found it thirty centuries ago; the Romans discovered it for use in making some of their equipment for conquering wars; the Indians of America were able to preserve their buffalo skins with it.

Tanning was perhaps the greatest industry, outside of agriculture, in the early days of America. Thirty years after the Mayflower dropped anchor in Plymouth harbor, there were more than 50 tanneries in New England. England demanded hides; the colonies were rich with trees endowed with tannin, and Boston became the leather market of the New World.

Nature stored tannin in almost all plants of the vegetable kingdom, so that wherever needed, man may find it to draw together and strengthen, make flexible yet sufficient against decay and wear, the hides of animals. While this somewhat general distribution was made, some places were more richly endowed than others, and man, with his economic problems, has developed those.

The bark of the hemlock tree was the first rich source of tannin, but the virgin forests disappeared gradually and other sources were sought. Oak barks produced a considerable quantity. The wood of the chestnut tree has come forward, as well as tannin producers of interesting foreign origin. Of the many products of our forests, that of tannin harvesting and production is one of the most important, representing an annual business by tanners and dyers of more than $30,000,000 in the product of tannin alone.

When hemlock was the major source of tannin, the tanneries grew up near the greatest stands of these trees. Where automobile trucks now trundle, many foreign voices chatter and Brooklyn Bridge swings its beautiful span across the East River,

STACKED CHESTNUT WOOD SEASONING IN THE YARD OF A SOUTHERN EXTRACT WORKS

One of the most important developments in the tannin industry in recent years has been that of taking this forest product from the wood of the beautiful chestnut tree.

was "The Swamp," an erstwhile center of the tanning industry. The first tanneries were along the eastern coast, but as the forests went they moved westward. Today, however, there is less shifting, for the tannin material comes by rail or ship, in large measure in concentrated extract. The conversion plants follow the source of supply but the tannery is a fixture.

The barks of the hemlock and oak still stand in the forefront in surrendering tannin to shoe us and glove us and suitcase us. The use of chestnut wood, however, has been one of the most important developments in recent years, and the importation of foreign tanning material from interesting climes and corners of the world has increased rapidly since the war.

FORTY-FIVE TONS OF HEMLOCK BARK FROM A WISCONSIN FOREST
Two horses sledding out a record load, rich in tannin, that would fill two railroad flat cars.

When the sap is running freely in the spring is the period of harvesting the bark of the hemlock. The trees are felled and marked off into four-foot lengths. Their rough overcoats are stripped off. The strips of bark are stood up to season for from a week to a month. The naked tree is cut into sawlog lengths and the barking crew moves on. In the days of vast forest wealth there were no few cases of logs stripped and left, or of trees shorn of their bark as high as was convenient and left to die. Maine, Michigan, New York, Pennsylvania, West Virginia and Wisconsin are the sextet of states that supply nine-tenths of the hemlock bark today.

The chestnut oak and the tanbark oak are the principal members of their family in providing tannin. It is most likely that the soles of your shoes were toughened and tanned with the oak's tannin wealth. In the northernmost states of the South are found most of the chestnut oaks, while the tanbarks fraternize with the redwoods of northern California and southern Oregon.

The wood of the beautiful chestnut tree now produces about 70 per cent of the tannin extract made in the United States. Virginia and North Carolina have a long lead in this, particularly because the chestnuts of these two states are far more wealthy in tannin than those further north. The trees are cut and floated or trucked to a grinding mill, where a "hog" chips and chews them to the size of coffee beans. The pulverized tree passes through several extractors and evaporators and emerges through a filter as the finished concentrated tannin extract.

Among the others of our domestic sources of tannin supply is the western hemlock. This has not been as yet asked to contribute much but has rich promise for the future. The bark, though thin, contains between 10 and 12 per cent of tannin and is richer in it by weight. When you see some bright yellow shoes, the pride and joy of their wearer, you may venture the guess that the leather was tanned from the black or yellow oak. The leaves of the sumac, if they are gathered before the fall has blushed them red and stolen the tannin, have rich content and are used in powdered form. Nature secreted some tannin in the roots of the cabbage palmetto, and in the roots of the canaigre, a dock growing in southwestern United States and northern Mexico.

One of the most important contributors to the world's supply of tannin extract, as well as to the supply in the United States, is the Quebracho tree. The home of this tree is the central plains of South

America. Its name is expressive Portuguese, meaning axe breaker, on account of its flinty hardness. It is also a very heavy wood and because of these two characteristics, it is largely exported in extract form. The greater proportion of its tannin is stored in the heartwood of this blunter of axes, although some is taken from the bark and some from the sapwood.

HEMLOCK BARK FROM THE FOREST FOR CONVERSION

During the war, the women in the tannin region of Wisconsin put their shoulders to the wheel of victory, and helped unload the strips of bark.

The bark of the mangrove tree is bidding for favor as a world producer of tannin. This is a tropical tree with a heavy and hard bark, rich in tannin. Its product is comparatively a newcomer to the United States, and is chiefly valuable when mixed with one of our domestic extracts. Another tannin most valuable when blended comes from the myrobalan nuts of India. These nuts are gathered by the natives and stored until they dry and shrivel. They are rich in tannin content running as high as 40 per cent, and give a tannin of light yellow hue. The product of these nuts is best used when blended and is specially fitted for belting, shoe-sole leather and harness.

In the West Indies, Mexico, Venezuela, northern Brazil and parts of Central America, is found a small tree yielding seed pods rich in tannin. These storage houses of the product are about three inches long, about three-quarters of an inch across and thin. They have been dubbed divi-divi. The use of this source is of recent origin in the United States although they have been known abroad for many years.

From a climbing shrub, native to the Dutch East Indies and going out into the world through the port of Singapore, comes gambier. This is a brown tannin, valuable in blend, coming from the boiled leaves of the shrub. It is used in the manufacture of glove leather. Another leafy source is the sumac from Sicily and southern Italy, very valuable for fine leather tanning work, and as an element of aniline dyes.

Valonia is the name given to the acorn cup of the Turkish oak. It is rich in tannin of a quality that must be blended to be used on leather. Australia, Tasmania and South Africa have found the barks of the acacia trees rich in tannin, and in the leather world their product is known as wattle or mimosa.

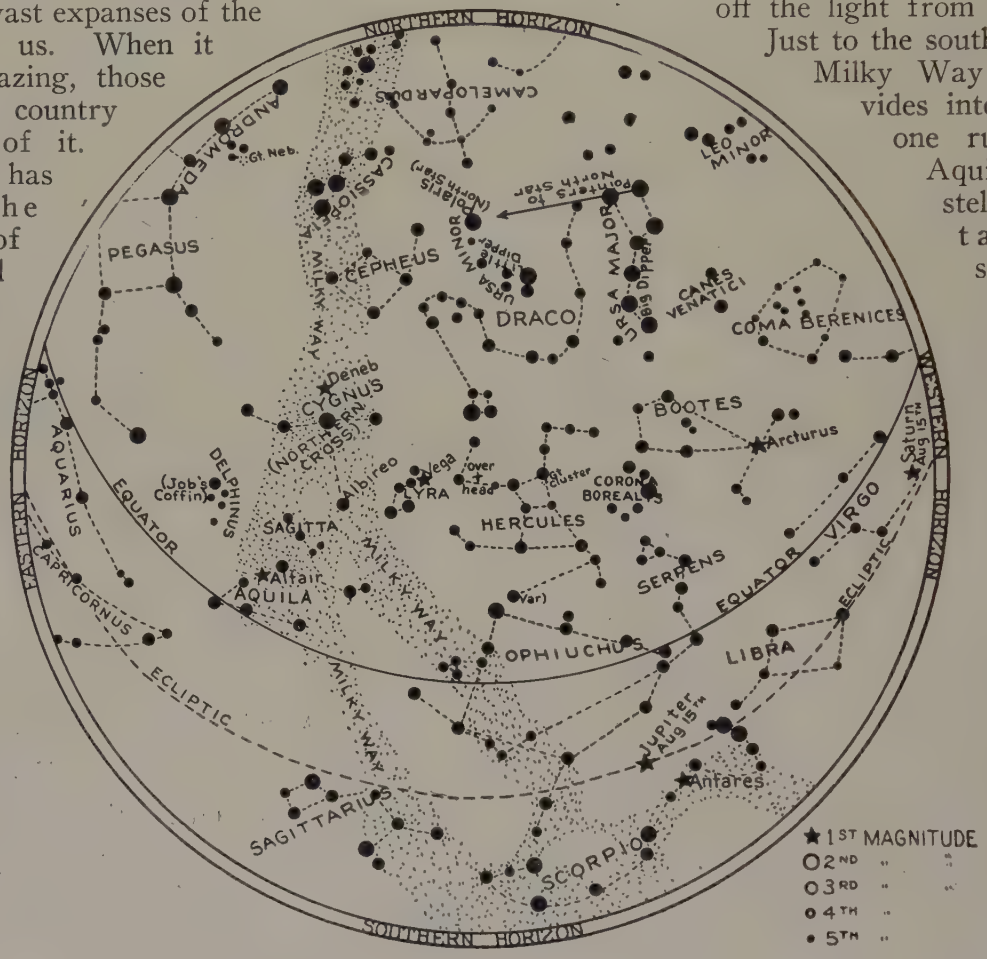
There are other places in which tannin has been stored. Some are known and have been developed somewhat; others are known but have not yet proved commercially valuable.

The forest, then, has another intimate importance to us for leather is a daily necessity. The depletion of our American forests has affected this as well as other trades—and many pocketbooks. The leather industry is interested in the task of reforestation that lies ahead, and the users of leather also. Nature, in fact, stored so many things of value in the repository of our trees and forests that there are few interests which even from a financial standpoint can afford not to cooperate to conserve and recreate them.

The Evening Sky in August

By ISABEL M. LEWIS

WHEN you are at the seashore or in the country on your vacation this summer do not fail to look for the Milky Way on some clear, dark night. City dwellers rarely get a glimpse of this magnificent girdle of the heavens for the glare of lights in the city at night dim all the lights of the stars above and high buildings shut off our view of the vast expanses of the universe around us. When it comes to star-gazing, those who live in the country have the best of it. The Milky Way has been called the groundwork of the universe. All the stars in the heavens seem to crowd toward it and its milky light is a blend of the light of many stars too distant and too faint to be seen as separate points of light except by powerful telescopes.



If the night is clear and dark and there is no moonlight, you will be able to trace the Milky Way through the constellation of Cassiopeia, the W-shaped group of stars in the northeast, and Cepheus to the south of it, to the constellation of Cygnus in which you will recognize the familiar Northern Cross lying directly in the path of the Milky Way. Here it is particularly brilliant and beautiful. It would be worth your while to look at this part of the Milky Way with a pair of binoculars or a small telescope if possible. If you have the latter look for the beautiful little blue and gold double star, Albireo, at the foot of the cross. It is considered to be the finest double star for small telescopes in the heavens. You will marvel at the richness and beauty of the dense clouds of stars in the Milky Way in Cygnus. Dark patches appear in the midst of the densest clouds of stars. These were once believed to be openings through which one gazed into starless spaces beyond, but now it is known that they are dark nebulous clouds consisting of minute particles of matter that shut off the light from regions beyond. Just to the south of Cygnus the Milky Way apparently divides into two branches, one running through Aquila to the constellation of Sagittarius, in the southeast, and the other through the eastern part of Ophiuchus to Scorpio. This apparent rift in the Milky Way is in reality another dark nebulous region of tremendous size and we can only guess at the nature of the region that it hides from our view, filled, doubtless, with countless unseen suns and worlds of space. Sagittarius and Scorpio are two of the most beautiful constellations now in view and they are easily found because of their location far over in the southern part of the heavens and because they are so brilliant and peculiarly formed, Sagittarius with its little milk dipper turned toward the southern horizon, and Scorpio with its long trailing tail of brilliant stars reaching nearly to the southern horizon.

Jupiter will now be found near the bright red star Antares, in Scorpio, a little to the west of due south at this time. It is the most brilliant object above the horizon just now, but soon it will have to

(CONTINUED ON PAGE 126)

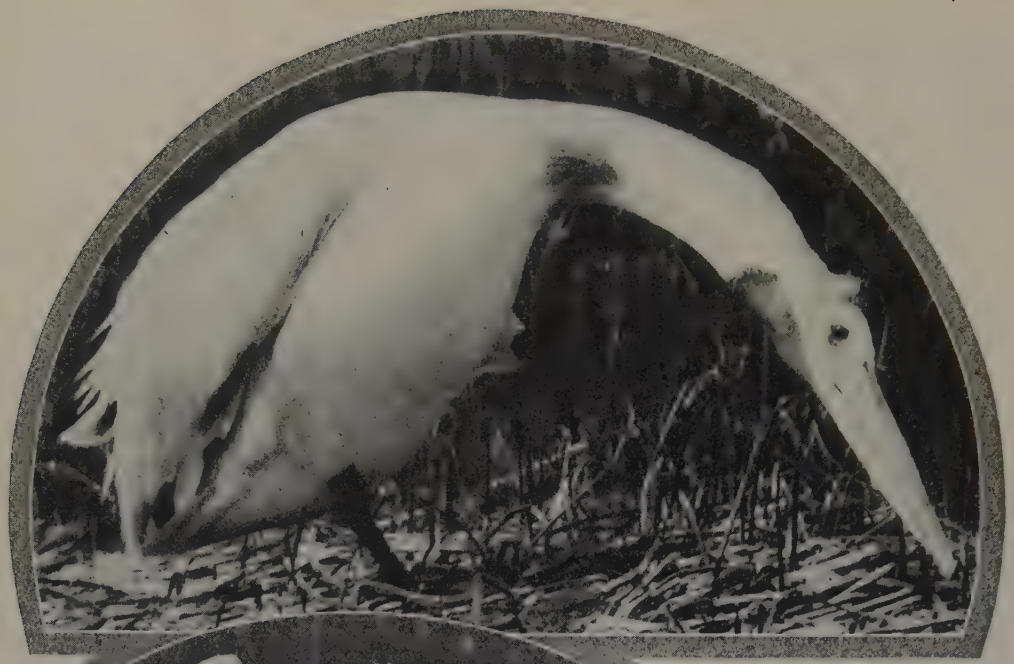
Hunting for the Cupboard

As a young pelican grows older, he catches on that the food comes from the parent's throat and he begins reaching from the pouch further back into the source of supply.

PHOTOS BY W. L. FINLEY AND H. T. BOHLMAN

A Good Neck-Hold

When a half-grown young pelican gets his bill down his mother's pouch, he is loath to come out. As a rule, she backs around for several yards, but he hangs on as long as possible.



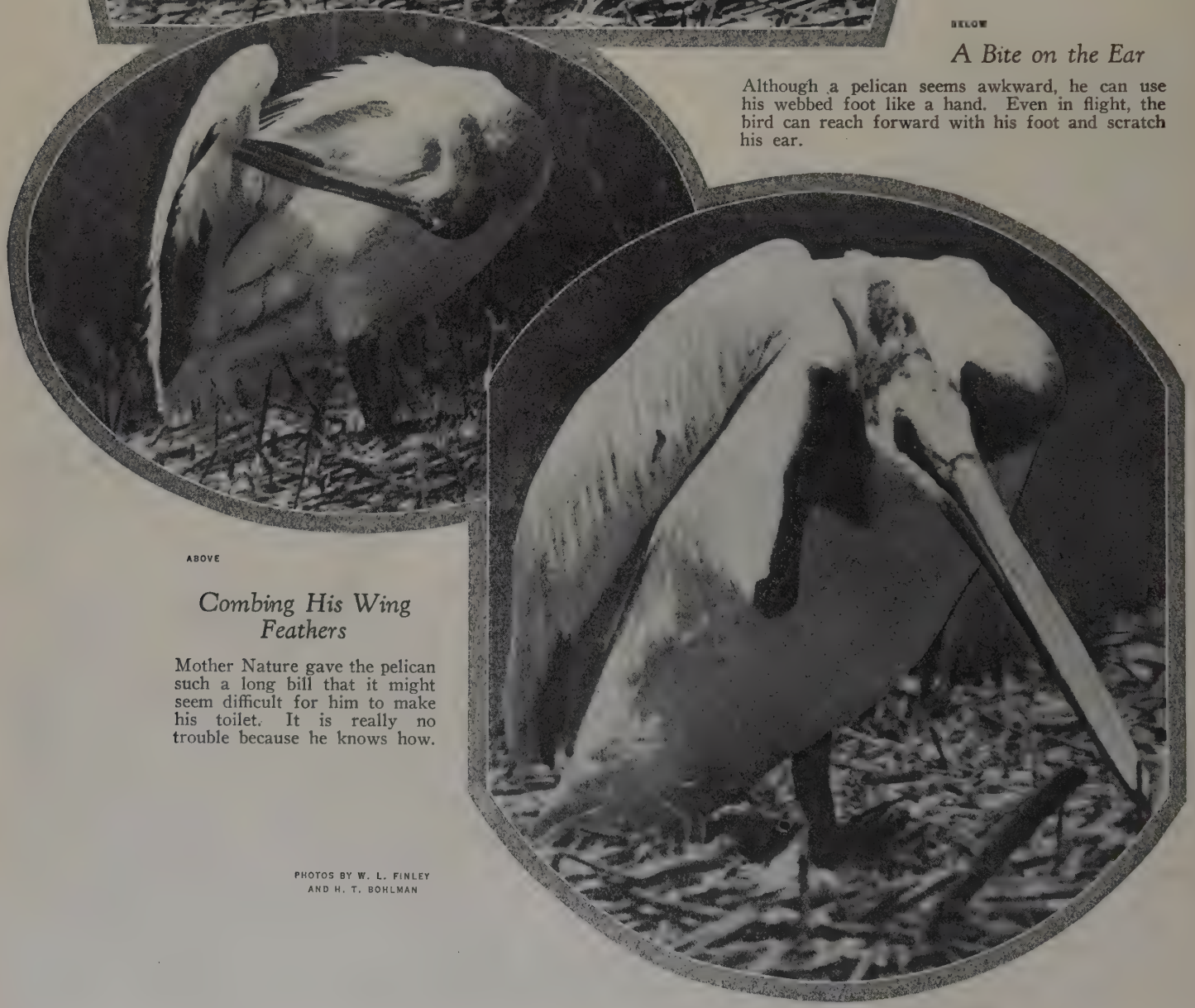
Pelican Acrobatics

There are certain spots a pelican cannot reach with his bill, so he combs out his neck feathers with his toes.

BELOW

A Bite on the Ear

Although a pelican seems awkward, he can use his webbed foot like a hand. Even in flight, the bird can reach forward with his foot and scratch his ear.



ABOVE

Combing His Wing Feathers

Mother Nature gave the pelican such a long bill that it might seem difficult for him to make his toilet. It is really no trouble because he knows how.

PHOTOS BY W. L. FINLEY AND H. T. BOHLMAN

PHOTOS BY W. L. FINLEY AND H. T. BOHLMAN

The End of the Act

After the high stretch, the pelican turns himself inside-out. His pouch is telescoped over his neck and chest. Here is a study in pelican anatomy. Find his tongue. It is the tiny flap about the size of the end of a toothpick at the entrance of his windpipe. A pelican doesn't need a tongue because he doesn't chew his food or talk.

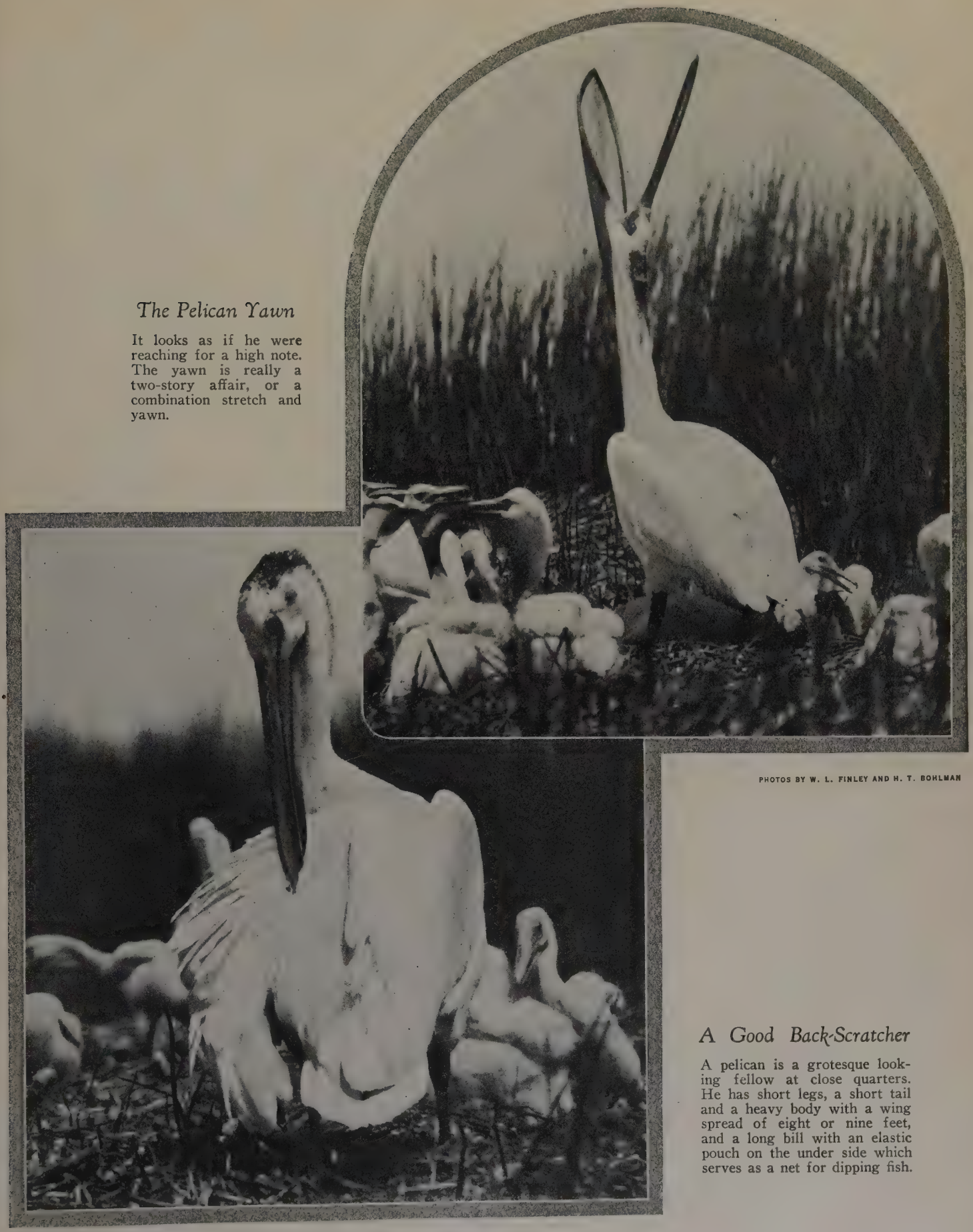
Reaching for a Difficult Spot

By stretching his neck and drawing his bill straight up, he can preen his upper chest.

PHOTOS BY W. L. FINLEY AND H. T. BOHLMAN

First Come, First Served

At luncheon time, a pelican squab likes to get his arms on the counter. It really looks as if the mother was trying to swallow her first-born.



The Pelican Yawn

It looks as if he were reaching for a high note. The yawn is really a two-story affair, or a combination stretch and yawn.

PHOTOS BY W. L. FINLEY AND H. T. BOHLMAN

A Good Back-Scratcher

A pelican is a grotesque looking fellow at close quarters. He has short legs, a short tail and a heavy body with a wing spread of eight or nine feet, and a long bill with an elastic pouch on the under side which serves as a net for dipping fish.

A Great Volcano in Eruption

By L. W. DE VIS-NORTON

Hawaiian Volcano Research Association

AFTER one hundred and thirty-four years of quite respectful behavior Pele, the great Hawaiian Goddess of Fire, has had a terrible outburst of temper. Most world travelers know that Pele is of all goddesses the most royal. Her splendid home in the depths of the crater of Kilauea on the large island of Hawaii is the most awe-inspiring spectacle on earth and at the same time is the most easily visited volcano in the world.

One may get into an automobile at Hilo, the beautiful little coast city, and after driving for thirty miles through all the glories of the tropics, one will emerge with amazing suddenness upon the very rim of the mighty crater itself. One looks down upon a world of utter devastation spread over an area of nearly 3,000 acres below his viewpoint, surrounded by perpendicular walls through which there is only one entrance. And an amazing automobile road leads through this entrance onto the lava floor of this crater and comes to a sudden end just as one becomes apprehensive of being driven headlong over the very rim of the inner throat or firepit that looms hardly fifty feet ahead.

And here the automobile comes to a stop and ten seconds later one has lost all sense of human proportion and is in a world absolutely apart: the strange realm of the mighty goddess Pele. At one's feet he sees the unbelievable process of the creation of the world, the formation of order from primal chaos. A mighty expanse of molten rock seethes and boils and eddies less than a hundred feet beneath the jagged rim upon which we stand, giant fountains of white-hot melt break through the lake surface and are hurled in clouds of glittering spray high above. From time to time avalanches of rock fall from the surrounding walls and go crashing into the molten lake, raising surging waves of fire that beat upon the bank.

The scene at night is one of appalling and indescribable grandeur. One stands in perfect safety upon the brink, shielding his face from the terrific heat with an impromptu mask made out of a cardboard picnic plate and watches spellbound hour after hour until sometimes the dawn comes upon him unawares.

This is the normal condition of Kilauea, the world's most famous "tame volcano."

Perhaps it was that the Goddess Pele began to resent the appellation "tame." Perhaps it was that like all her charming sex she decided to go into hysterics. Anyhow on the 11th of May, with only a few preliminary earthquakes as a warning, she burst out in a terrific explosion that hurled rocks and burning sand and gravel in every direction. A mighty column of gas-charged smoke and fume surged from the throat of the great crater and poured up and up and up until by actual triangulation its height was found to be the dizzy elevation of twelve miles. Torn by jagged streaks of vivid blue lightnings, roaring and crashing with unceasing peals of thunder, punctuated by the staccato crack of rock masses as they hit the crater floor and burst asunder, this explosion was a terrifying spectacle. But it was only the first of a series that occurred every few hours for more than two weeks, increasing in intensity and splendor until they reached a point of climax and thereafter began to die down.

The photograph here published gives an excellent idea of the commencing phase of one of these terrific explosions and close inspection will show the pouring down of hot sand and the falling of rocks upon the crater floor. It was taken at great risk from a point nearly a mile away upon the western wall of the outer crater.

Kilauea has ever been a great tourist resort and thousands of visitors have been fortunate enough to be able to witness portions of the great eruption the volcano is now staging. It seems strange that people should flock to such a spectacle instead of running away from it, but the scientists in charge of the little volcano observatory that perches upon the outer rim of the crater have made excellent regulations for the safety of the public and at the approach of any real danger steps are taken for the prompt evacuation of the neighborhood.

It is interesting to note that the scientific study of volcanoes has so far progressed as to have made it possible to foretell this great eruption with amazing accuracy, a prediction now verified having been published in 1919. The work has been carried on very quietly and unostentatiously, but its value from a humanitarian standpoint has been justified a thousand times over by the accuracy of its prognostications.

Native North American Orchids

By L. W. BROWNELL

THE name "orchid" usually carries to our minds the impression of those superbly beautiful exotic forms found only in our greenhouses; yet there are, in the northeastern United States alone, no less than sixty distinct native or wild species.

These are not aerial or parasitic in their growth like the greenhouse varieties, but grow in the earth from bulbous or tuberous roots. One of the first to be discussed, because it blooms early in the spring, is the showy orchis which, although nowhere very common, may be found during May amid the deeper woods where the soil is rich and black. Its two broad fleshy leaves show glossy green on the upper sides, and silvery underneath. From them the thick five-sided stem rises to a height of five to ten inches, topped with a loose spike of three to six flowers. These flowers are purple and white, the "lip" being white while the petals and sepals are purple, the latter uniting in an arching hood. Of the six floral leaves with which every orchid is provided, the three outer ones, the sepals, are similar, two of the inner ones, the petals, are alike, but the third hangs or projects forward in an odd form. This, the "lip," is a peculiarity possessed by the entire orchid family.

Closely related to the showy orchids, are the habenarias, a genus of which about eighteen species are natives of the eastern states. They are partial to low moist ground, so that the seeker must be willing to risk a wet-footed search of our most forbidding bogs and swamps. The blossoms are so exquisitely dainty that the finding of them is well worth all the trouble and discomfort.

The largest and most showy of the eastern species is the large purple fringed orchis. The first sight of one of these in full bloom is a thing that one can never forget. Its solitary stem reaches a height of one to five feet and is crowned with a cluster of purplish blooms from three to fifteen inches long. The small purple fringed orchis is almost a miniature of its

YELLOW LADY'S-SLIPPER
(Cypripedium parviflorum)

PINK LADY'S-SLIPPER
(Cypripedium acaule)

SHOWY LADY'S-SLIPPER
(Cypripedium reginae)

L. W. BROWNELL

Known as downy rattlesnake plantain, which is an orchid and not a plantain. (Peramium pubescens.)

larger sister, and is more common. The white fringed orchis is found in bogs, ranging from Canada to the Gulf of Mexico, and one must sink nearly to his knees at every step in his search for it. It sends up its stem to a height of two to three feet, topped with a loose, many-flowered cluster of white blooms.

Very similar to the latter in growth, structure, and habitat is the yellow fringed orchis (H. ciliaris). The two can frequently be found in the same bog, although the latter is really a more southern species, being found as far south as Florida. Its bright yellow flower cluster is worth the trouble to find. Far less conspicuous is the Hooker orchis, its small, greenish-yellow blooms often being overlooked by the closest observers.

L. W. BROWNELL

PURPLE FRINGED ORCHIS

This is probably the small purple fringed orchis, but it may be the large purple fringed orchis. At any rate it is a fine specimen.

Of all the eastern orchids the ones best known

(TO LEFT)

Rose pogonia (Pogonia ophioglossoides)

(TO RIGHT)

Nodding Ladies'-Tresses (Ibidium cernuum)

are the lady's-slippers (Cypripedium). A legend of the Indians tells us that when the whip-poor-wills went nightly to their wooing they took their choice of these flowers, pink, white, or yellow, to use as moccasins. Hence come the names, "whip-poor-will's shoes" and "moccasin flowers." Their slight resemblance to footgear has also gained for them such names as: "our lady's sabot," "priest's shoe," and indeed the Latin name means "Venus' shoe," as literally translated.

The pink lady's-slipper is the most common, blooming in the woods in late May or early June on a moss-covered surface. Where it is found it usually grows in considerable numbers, but due to the depredations of people who cannot resist the temptation of picking all within reach, it has be-

come more rare each year. The large yellow lady's-slipper is nowhere so common as the pink, and grows singly or in very small groups. It chooses dry, rocky woods.

The largest and most showy of this genus, the showy lady's-slipper, chooses to hide itself in swamps. Its large white sac, with its splashes of purplish pink, looks, as one writer has said, as though wine had overflowed its cup and trickled down the sides. One's first instinct upon plucking one of these blossoms is to smell it, but it has no fragrance, relying solely upon its beauty for existence. I am sorry to have to add a word derogatory to the reputation of so beautiful a flower, but the fact remains that it will sometimes revenge itself upon those who ruthlessly pluck it by poisoning them in much the same manner as does the poison ivy. The small yellow lady's-slipper, a smaller edition of the large one, is common in many localities throughout the New England States.

In dry woods, particularly in the shadow of the hemlock, grow the rattlesnake plantains, the tufts of their grey-green leaves delicately marked with netted veinings. The resemblance to the markings on a snake's belly is really responsible for its name but the Indians once supposed it to have curative power for the bite of a rattlesnake. The two species common in the eastern states are the lesser rattlesnake plantain and the downy rattlesnake plantain.

SHOWY ORCHIS
(Orchis spectabilis)
This is nowhere very common, but covers a wide range and is found amid deep woods in rich black soil.

Well hidden among the long grasses of our fresh water marshes and low, wet meadows dwells a modest little orchid, the rose pogonia. In color a delicate rose pink and with a faint but delightful perfume, it is to me one of the daintiest of all our native orchids. It is plentiful but so securely does it hide itself that it is often passed by. It blooms in late June and throughout July. Somewhat similar in form, although a resident of more northern latitudes, is the arethusa. Its long slender stem bears but one pink flower, with a delicate violet-like odor. Alas, so many of these plants have, in late years, been gathered for exportation to European hot-houses, that many a northern bog knows them no more. Like the nymph Arethusa, whom Diana caused to be changed into an overflowing fountain in order to protect her from the persecutions of the love-mad river god, this little plant chooses the spring-fed marshes where her destroyers will be less likely to follow. Linnaeus, fancying this resemblance, gave to the flower this name.

The coralroots, so named from the formation of their roots, may well be called the black sheep of the orchid family. Their long brown naked stems, pushing their way from the damp decaying mould of the woods, devoid of leaves and in company with other parasites, such as Indian pipes, make us feel that they have fallen low indeed for a member of such an aristocratic family.

There is a little dweller of our northern peat bogs called calypso from the Calypso of old, who fell in love with Ulysses and detained him for seven years on her island, dying of a broken heart when he left. Calypso is a solitary little flower, blooming from the top of a jointed scape that grows to a height of five or six inches from the bulb. It can boast of but one nearly round leaf near its base. The solitary purple blossom bears a slight resemblance to the lady's slippers and from this fact it was originally placed in the same genus. Now, however, it can boast of a genus all its own.

In the meadows and wet places where grow the pogonias and other bog lovers, there are also found the calopogon or grasspink orchid. Calopogon means "beautiful beard." The flowers, purplish pink in color, and with bearded lips, bloom in spikes of three to fifteen blossoms at the end of the foot-long scape. At the base it a single lanceolate leaf.

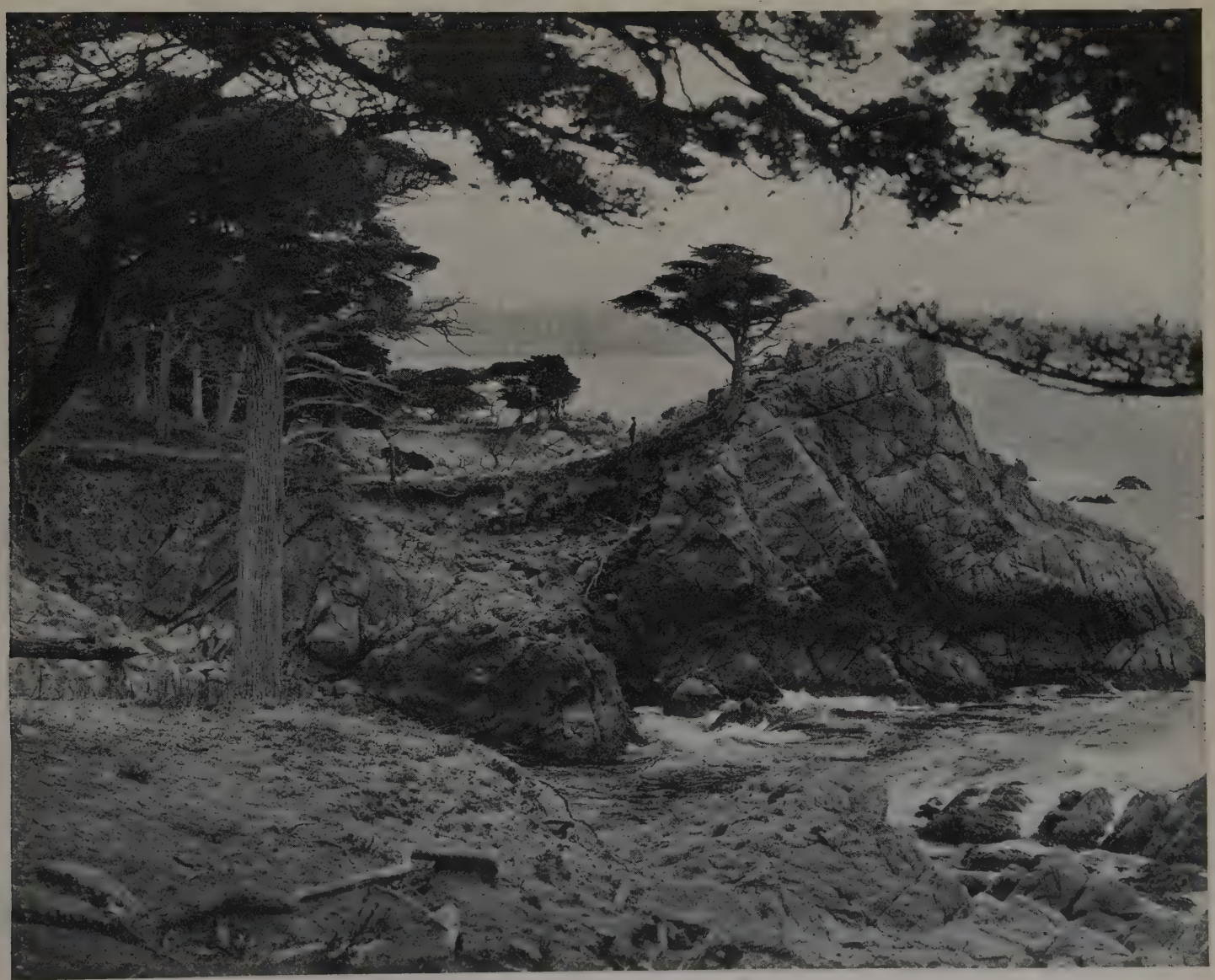
The last orchids of the year bloom in September and October. They are the ladies'-tresses, probably the most common of the orchid family in eastern North America. All country dwellers know their stiff, upright, slightly twisted scapes and long dense whorls of small white blossoms. The two most common are the nodding ladies' tresses and the slender ladies'-tresses.

Survivors of a Glorious Past

By LELA COLE KITSON

A TORREY pine-tree with its low, sprawling branches, long bunchy needles and squat plump cones etched against the pure orange glow of a California sunset, suggests at once the clear-cut beauty of a Japanese print. This odd little conifer, together with the Monterey Pine, Monterey Cypress, Knob-cone Pine, Bishop Pine, and Gowen Cypress, belongs to that small and select group of California trees which occur only in what are known as "Arboreal Islands." Indeed these groups of Native Sons are said to be the last remnants of a great forest that at one time extended from the present Coast Range out to what are now the islands lying from twenty to forty miles off the California shore.

The Torrey Pine itself is restricted in habitat to the Southern California coast near San Diego, and the Santa Barbara Islands. So rare is this



WIND-SWEPT CYPRESS TREES ON SEVENTEEN-MILE DRIVE, MONTEREY, CALIFORNIA

This is one of the best known of the cypress pictures and is famous as a scene from one of the well-known moving picture plays.

species that a municipal park has been created to protect the few remaining specimens, thus assuring them a slightly longer lease of life. Yet none of these arboreal island groups is increasing, and their days are numbered. The Torrey sometimes grows straight and tall to a height of sixty feet, but for the most part it does not attain thirty-five feet and hugs the ground with its quaintly twisted branches. It is remarkable for the length of its needles, which are from eight to twelve inches long, and its peculiarly armored cones, the scales of which are thickened at the apex into heavy pyramids. W. L. Jepon thus accounts for the peculiar occurrence of the species:

THE TWIN SISTERS

These are two famous specimens of the Torrey Pine growing near San Diego.

THE LAST OF A MIGHTY RACE

Thousands of years ago a great forest of Torrey Pines, Knob Pines, Gowen Cypress and Monterey Cypress probably extended from the present coast range forty miles beyond the present California shore.

"At the end of the Pliocene period there was inaugurated a tremendous series of earth movements on the California coast. Geologists are by no means agreed as to the period and duration of these oscillations but in the Tertiary and Quaternary there was at intervals land connection between the present mainland and the Santa Barbara Islands. A moister climate in the Pliocene or Pleistocene periods would permit the existence of a great forest along the California coast and its extension southwards over a large land area which now rests beneath the Pacific Ocean save for the emersed peaks of the Santa Barbara Islands. Subsidence of the mountainous South Coast Range area left only vestiges of this forest on the emersed peaks or islands. . . . The final uplift of the Coast Ranges, with the species following the receding shore downwards, accompanied by changes and diversification in climatic conditions, would account for the persistence and isolation of the present arboreal islands of Monterey Pine, Monterey Cypress, and other species along the California coast line."

A MONTEREY CYPRESS

This tree, justly famous for its artistic beauty, is found only in the Monterey Peninsula of California.

The tree was named in honor of John Torrey, professor of botany in Columbia University, a student of western botany who visited California and studied its flora long before the era of the transcontinental railroad.

ON THE WESTERN EDGE OF AMERICA

The Torrey pine for the most part hugs the ground with its quaintly twisted branches. It is remarkable for its needles, eight to twelve inches long.

Mill or Meadow, Which Shall It Be?

SHUTTLING bobbins, whirring belts, whining wheels, clattering spindles, the ceaseless monotony of a factory roaring at labor. In this din work Mary and Frank, their tired eyes in young-old faces watching for broken threads in the darting machines, or their small bodies bent over deadening toil.

Twinkling brook, trilling songbird, honking frog, waving grass and leaves, the endless beauty of Nature at work. In this free wonderland of the out-of-doors are another Mary and Frank, bright eyes darting to discover Nature's secrets, strong bodies bent to watch the ant at his work or the fish slithering along the dark bed of the brook.

TOO YOUNG TO WORK: TOO OLD TO PLAY

Robbed of child rights, this little chap must trade them for a pittance.

These are two pictures, done in sweeping strokes, which should give all Americans pause. They represent two extremes. They show child labor on the one hand; child rights on the other.

Congress at its last session passed a constitutional amendment for the prohibition of child labor. The legislatures of all the states will be called upon to consider and pass upon this amendment. It will become a part of the Constitution of the United States when two-thirds of them have done so. Why are they asked to do this?

"Inalienable rights" is a phrase frequently heard. "Inalienable" means that which cannot be surrendered. In this free democracy health, recreation and education are the inalienable rights of the children who are to be the future citizens. They have not surrendered these rights, but thousands have had them taken from them by parents who forced them through ignorance or their own need, or by industry that demanded them.

We have recently had a great national conference on outdoor recreation. At this meeting the value of the existing facilities and the need of more was emphasized. Particular stress was placed upon the far-reaching physical and mental value of bringing Nature to young people and grown-ups, and of providing courses in Nature Study in the schools. One of the greatest things that this conference might accomplish would be to bring these assets nearer to the million children who even now labor in factory or on farm.

A knowledge of Nature, whether through parks or just in the outdoors, has become an essential of education. It is a duty of the schools to teach it. The contact with Nature arising out of this knowledge will bring health and exercise to the young people. And in bringing these two properties of a sound mind and body, it gives, as well, the third right of recreation.

There are economic and social problems that go with the solution of the child labor question. There are the problems of substituting for the life-taking labor now found, work that will be followed for the enjoyment and pride in it and yet return some profit. Such problems are being solved by such organizations as the "Four-H-Clubs" of West Virginia, which encourage the development of head, hand, heart and health

HUCK FINN?—NO, BUT JUST AS HAPPY

Bright eyes darting to discover Nature's secrets; strong body ready for life's demands.

SCHOOL ROOM OR TOBACCO FIELD AT TEN,—WHICH?

What chance have head, hand, heart and health to shape Mary's future?

(CONTINUED ON PAGE 123)

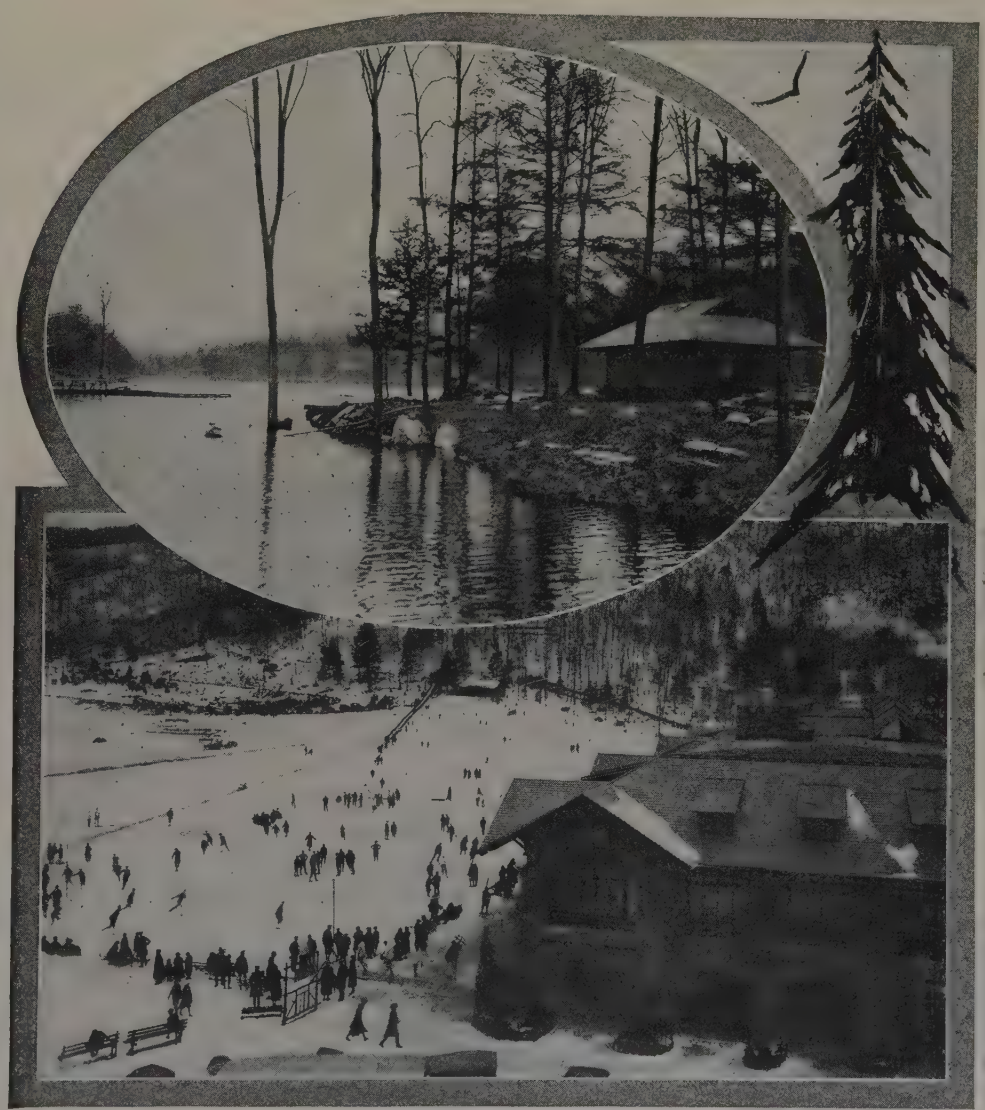
Camping in the Palisades State Park

By RUBY M. JOLLIFFE

IN 1910, through the gift of Mrs. E. H. Harriman, 10,000 acres of unspoiled forest land in New York State along the Hudson River was made available to the public and entrusted to the direction of the Commissioners of the Palisades Interstate Park, with one million dollars for its development. From time to time more land has been purchased or given until now there is a tract of over 40,000 acres. This land stretches from Storm King, with the exception of a few miles round West Point, south and west about seventeen and one-half miles toward the Ramapo River near Tuxedo. The land is unspoiled forest with many hills, plains and valleys, picturesque lakes and fine streams. It has been made accessible to the people of the cities through the constructing of automobile roads and through the means of transportation offered by Hudson River boats. Trails have been opened up through the woods and have encouraged many real lovers of the woods to explore what is unknown to the other tourists.

Another section of Park is that which stretches for twelve miles up the Hudson River from the city of New York and is known as the Palisades. At the base of the cliffs are sandy beaches which offer excellent camping sites. Permits are granted for individuals to pitch their tents here where no group camping is allowed. These beaches are near enough to New York for commuters to live out of doors and the popularity of this sort of life is shown by the fact that altogether nearly 30,000 people spent a part of last summer under canvas in this section of the Park and in the above-mentioned Harriman State Park.

The large acreage back of Bear Mountain itself is devoted to group camping and here you will find one of the greatest experimental, demonstration camping fields in the world. All varieties of organized group camps may be found hidden away among the trees on fifteen lakes.



In summer camps along the lake shores, the ideal places for warm weather recreation are found. Skating, skiing, sledding and tobogganing attract thousands of lovers of winter sports.

The buildings for each camp comprise a standard camping unit and are built by the commission of chestnut logs cut in the reservation.

Through the agencies conducting these camps nearly 7,500 children and young people live each week in the out-of-doors — a total of about 75,000 camping weeks.

Recreational programs are planned by each individual camp and since few playgrounds can be built in the woods, the commission has cleared near each lake a space for the use of those

city children who want their baseball games. Water sports are the most popular and help and encouragement is given to all the camps to give each camper a chance to learn to swim and to row the flat-bottom boats which are provided on the lakes and which are as safe as they are roomy. Intercamp aquatic meets are planned on the various lakes and games of all sorts on water and on land are enjoyed by campers of all ages.

The Camp Department is especially anxious to interest campers in the study of their surroundings

EXHIBIT PREPARED BY THE NATURE STUDY CLASSES

The Park, owing to its location, is particularly adapted to nature study, for wild life is protected and is of great variety.

and for three years has been appropriating a small fund for that purpose. Some surveys and field examinations have been made by the Department of Forest Zoology of the New York State College of Forestry on fish in the lakes and ponds and on the use of fish for the control of mosquitoes. There has also been a report on the birds and a list made of recognized flora and fauna. Three successful beaver colonies have been set out and a number of elk have been added to the wild life abounding in this great game refuge.

The Park is particularly adapted to nature study on account of its peculiar location. It is in the transition line between the north and south—a little south you have the Carolinian flora and fauna, while slightly north throughout the Catskills you find more of the Canadian wild life. Here there are birds of all kinds, including the migratory species. You will find hills of rock and hills well wooded; valleys which are dry and valleys which are marshy. All kinds of fields are awaiting experimentation in this area where wild life is protected.

To interest the city young people in conserving this wild life and in preserving the beauty and usefulness of the reservation and to encourage this study among the camps, the Camp Department employs a nature work executive, this season, Mr. Henry E. Childs, assisted by one or two young women graduates of Cornell University and supplemented by Dr. B. T. B. Hyde and others from the Boy Scout Museum at Kanawauke. This staff will act as special instructors and will assist the nature study counsellors employed by the camping organizations themselves. During the season museums or nature nooks are set up in the camps to which the campers bring all kinds of growing things which they pick up on their walks in the woods. Care is taken that only one specimen of each kind is brought in and these are restricted; certain

(CONTINUED ON PAGE 122)

Dragon Flies and Damsel Flies

By A. BROOKER KLUGH
Contributing Editor, "Nature Magazine"

(PHOTOGRAPHS BY THE AUTHOR)

THROUGHOUT the summer, in the vicinity of water and often also in woodland glades, we find dragon flies and damsel flies on the wing. It is not always the same species which are present throughout this period, as each species has its season of emergence, flight, and egg-laying, followed by the death of the adults, but as the season of one species is waning that of another is beginning, so that several species are to be seen at any time from May until late September.

These two groups of insects differ chiefly in the following characteristics. In the dragon flies the hindwings are broader at the base than the frontwings; the eyes, while very large, do not project noticeably from the head; and the wings are held horizontally when the insect is at rest.

In the damsel flies both wings are similar in shape and are narrowed at the base, the eyes project markedly from the head, giving the insect a "hammer-headed" appearance, and the wings are brought together lengthwise over the back when the insect is resting.

Among insects the dragon flies stand supreme in their complete mastery of the air—for their swiftness and quick changes of direction in flight and their power of endurance on the wing. Some species fly at the rate of sixty miles an hour. The wings are controlled by powerful muscles, and the front margin of the wing is strengthened by two heavy veins, with flat, vertical, plate-like braces between them.

They also possess the keenest sight of all

COMMON DRAGON FLY

These insects stand supreme in their complete mastery of the air, for their swiftness and quick changes of direction. Some species fly at the rate of sixty miles an hour.

insects. The great compound eyes, which make up over two-thirds of the head, have about thirty thousand ommatidia, the individual eye elements which make up the compound eye. Their eyes are adapted for both near and far vision, not, like most insects, only for seeing clearly at some one fixed distance. This is brought about by the presence of two kinds of ommatidia in their eyes, the upper and outer ommatidia being adapted for

NYMPH OF A DRAGON FLY

When this grows up it feeds largely on mosquitoes and flies catching them with its six legs while in swift flight.

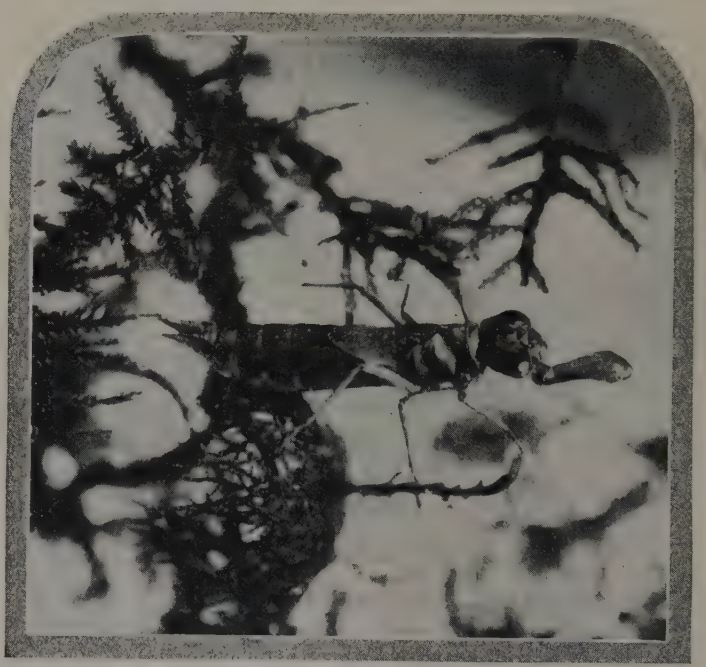
far vision and the lower and inner for near vision. They are thus in much the same condition as a man wearing a pair of "bi-focal" spectacles. They apparently perceive the form of objects quite well up to a distance of six feet, thus being extremely long-sighted for an insect, as in most insects the limit of distinct vision is about six inches or less. They perceive movement at a distance of about sixty feet.

If a dragonfly is caught and held in the hand, the eyes are seen to glow with a most beautiful light, usually of a green or blue color. This is due to reflection of light from the interior of the eye. If we look closely into the eye, we see, apparently far down in the eye, a very distinct black spot. This black spot is due to the complete absorption of the light which passes straight down into the eye.

Dragon flies feed on the wing. The prey is apparently caught with the legs—all six legs being brought together beneath the head to form a sort of basket—and then transferred to the mouth, the whole operation being accomplished with lightning-like rapidity. The name "mosquito hawk" sometimes applied to the dragon flies is not at all a bad name, as they consume larger numbers of these pests, as well as many midges, and are consequently to be regarded as friends of man. Flying insects of many kinds, including smaller species of dragon flies and damsel flies, are eaten, but flies, mosquitoes, midges and gnats certainly constitute the principal item on the menu of most dragon flies. Since dragon flies are on the wing on bright sunny days and remain at rest on dull days they naturally feed chiefly in fine weather. Even on sunny days they have two fairly well-marked periods of feeding, in the forenoon and in the late afternoon, and this is particularly true when they are mating and egg laying, as these activities are usually engaged in about noon. They are extremely voracious, and one has been known to eat forty flies in two hours.

No insects, with the possible exception of butterflies and moths, exhibit greater beauty of coloration than the dragon flies. Note the delicate rainbow or mother-of-pearl effect which is seen on the wings of recently emerged dragon flies, and the metallic colors which are so prominent in many species.

The eggs of dragon flies are laid on the surface



NYMPH OF A DRAGON FLY

The mother of this young insect may have laid as many as one hundred thousand eggs. These hatch in from five to fifteen days.

of the water, or, in the case of a few species, are inserted into the stems of aquatic plants. From a thousand to a hundred thousand eggs are produced by a single female. The eggs usually hatch in from five to fifteen days. Before hatching the embryo lies with its head fitting closely under the cap of the egg, the compound eyes are distinct and all the mouth parts can be seen.

The nymph is a somewhat flattened animal with

a big head, the relative length and breadth of the body, and the length of the legs depending on the species. The chief peculiarity of the nymph is the remarkable modification of the lower lip into a most efficient organ for capturing prey. The two lower parts of the lip, which in most insects, and also in the adult dragon fly, are short, are greatly lengthened, and the second part bears a pair of toothed "jaws."

BLACK DAMSEL FLY

This species, whose wings have a sheen of copper, green and violet, is a hunter in woodland glades.

The manner in which this apparatus is used in capturing prey is as follows. The nymph either remains absolutely motionless until a victim comes within striking distance, or slowly and stealthily stalks its prey until it is close enough to strike. Then the lip is shot out with lightning-like rapidity. At the same time the "jaws" are thrown wide open, and their movable hooks are shot outwards so that as the prey is seized these hooks enter its body and hold it securely. Once grasped between the "jaws," the prey is drawn quickly to the mouth and chewed into pieces small enough to swallow.

The chief food of the nymphs consists of minute crustaceans, especially "water fleas," and aquatic insects. Some of the larger species devour not only quite large aquatic insects but sometimes also capture young fish.

The length of time spent in the nymphal stage depends upon the species. In the majority of species it is a year, in some it is two years, in a few it is from three to five years. During its life the nymph moults from eleven to fifteen times, the number of moults depending not only on the length of the

DAMSEL FLIES

On the top stalk of the sedge is the female fly. On the bottom stalk the male of the species.

(CONTINUED ON PAGE 126)

Nature and Human Nature

A Story of the Woodcraft Idea

By ERNEST THOMPSON SETON

Chief of the Woodcraft League

*(This is a continuation of the article by Mr. Seton which appeared in the May, 1924, issue of "Nature Magazine."—*EDITOR.)

OVER twenty years ago I found myself in the position to realize a dream that most men have held in their hearts. I bought a stretch of wild land in a country place. Considerably over a hundred acres there were, most of it covered with glorious woods, but varied with rocky hills, a beautiful brook and a lake. Around this I put a ten-foot fence, tight for man and beast, and stocked the place with animals and wild fowl. Here I intended to carry on many experiments and live a life that is commonly considered ideal.

I paid for the place and thought I owned it. But the boys of the neighboring village thought otherwise. I had fenced in waste land on which they long had hunted and played. I was an outsider, an interloper, a nuisance, and they set about freezing me out. Their idea of doing the same was by making it hot for me. They destroyed my fence, they painted wicked pictures on my gate, they shot my animals. All summer long the gang kept up this work, and all summer long, thinking I could wear them out with patient nonresistance, I repaired the fence, repainted the gate and replaced the animals, without any prospect of the warfare ending.

One Saturday morning in September I was busy painting out some shocking frescoes on the gate when a gang of these boys came by. I said to them: "Now, boys, I don't know who has painted this gate, and I don't wish to know, but if you know, I wish you would ask him to stop. It does not do the gate any good. I simply have to paint it over again, and it already has had as many coats of paint as are of any use."

The boys said nothing, but giggled, whistled and passed on.

The next morning, the gate and the fence, and even the adjoining trees and rocks were covered with dreadful pictures that not even the Sunday newspapers would have printed, and they were further embellished with inscriptions to give them personal point.

I saw now that talking had no effect. I had already proved pacifism a failure, and I set about a different scheme.

On Monday morning I went to the village school and asked the teacher if I might talk to the boys for five minutes. She said: "Certainly! Go ahead."

Then I said: "Will all the boys twelve years old and upwards please stand?" They did so. There were about a dozen. I continued: "Now, boys, I invite you here standing, and any that may happen to be away today, to come to my place at the Indian village on the lake next Friday afternoon after school, to camp with me there from Friday afternoon till Monday morning before school. I will have tents, boats, canoes, firewood, grub—everything necessary for a campout. I ask you to bring only two blankets each, and I ask you not to bring any guns, matches, tobacco or whiskey. These things I will not have in camp. Now, will you come?"

The answer was a most eloquent outburst of—dead silence. There was not the faintest sort of response, not a gleam of interest that I could see. I was puzzled. I knew that many of these boys had been in my Indian village—because it was forbidden. They knew all about the location and its possibilities for fun. But not a word did they say in reply to the invitation.

Thinking that they had not understood me, I repeated and said: "Remember, you do not have to pay anything. You come as my guests. We are going to camp out and have some fun together."

No answer at all from any part of the room was heard. I was facing a stone wall of stolid silence and was wholly at a loss. Had they said *no,* I was ready to meet it. Or a qualified *yes,* I could have managed, but blank, expressionless silence was beyond me.

Standing close to me in front was a tall, good-looking boy with very bright eyes. I sized him up as no fool. Addressing him directly and personally, I said: "Don't you care to come for a camping trip in the woods, with everything provided?" His answer was a nod of the head.

I picked on another fellow farther back, and to the same question I got a similar reply. Assuming that this was what they meant, I left without further questions.

That week, I made complete preparations for the

camp. Tents, tepees, boats and canoes were put in good shape. One of my men was appointed cook, and provided with abundance of provisions. I had seen a dozen boys, but to avoid any pinch I prepared food for eighteen. All was ready Friday at four o'clock. But no boys came.

I waited patiently until quarter after four—but no boys. Half past four—and no one. Now, my cook, who did not at all relish his job, began croaking: "I told you! I told you so! You won't get any satisfaction out of them fellers. The only thing that will do them any good is a rawhide, well laid on the right place."

I said: "No, I don't believe in that. I have seen it tried many times, and I have never seen it work." But I must say I felt very unhappy.

Ten minutes later, and my nervous worry increased. I had nothing to do but wait. I could not help thinking of the old nursery rhyme: "Mr. Smarty gave a party and nobody came."

My cook's croakings grew jubilant; but a quarter before five there was a racket and a riot on the main drive, and in came the boys all together. Not the twelve I had seen, not the eighteen I had provided for, but—forty-two, a perfectly ideal party—twelve invitations and forty-two acceptances.

In they came, each carrying his two old blankets. They got over their bashfulness in about ten seconds. Then one of them said: "Say, mister, kin we holler?"

"Surely," I replied, "blow your lungs out if you want to." And they tried. The neighbors told me afterwards that they heard them two miles away. I quite believe it.

Next they asked: "Kin we take off our clothes?"

"Yes, indeed," I answered, "every rag, and the sooner the better." So the gang peeled off and jumped into the lake. And very glad I was to see them there. Tearing through the dry woods, I did not know what mischief they might do. But in the lake, I could watch them and keep them out of harm. They swam and splashed and pelted each other with mud, and upset the boats for about an hour. Then we called them to supper.

They came, and in the language of Scripture, "they did eat."

I never saw boys eat harder or more. All the food provided to last till Monday, they cleared up that night. Which was all right, their number being unexpected, and Saturday next day gave a chance to restock. After stuffing themselves for an hour, they were lying around, limp with feeding, like a lot of gorged boa-constrictors.

Then I gathered them around the blazing fire and played my next card. I said: "Now, shall I tell you a story?" The leader shouted: "Ye betcher life! Go ahead!" Thus graciously permitted, I went ahead and told them stories of wild life and animals I had seen, carefully working up to a grand climax. About eight o'clock, as I looked around the group with the black forest behind and the stars overhead, I noted that the little fellows were not at all sleepy, and the big fellows had ceased their rough, practical jokes. All were listening.

Then I decided that the psychological moment had arrived for my next move. I said: "Now, fellows, how shall we do this campout? Any old rough-and-tumble way, or in the real old Indian fashion?"

In view of the atmosphere which I had deliberately created, there was only one answer possible. They shouted: "Injuns, ye betcher life!"

"Very good," I replied, "that will suit me. Now this is the tribe. Each brave has one vote, and we begin by electing a head chief."

Then these boys gave their very first symptom of politeness. They said: "Guess we'll take you." But I promptly crushed their politeness. I said: "Oh, no, you don't. I am not the chief. I am the medicine man, and shall keep out of sight. For chief, I want one of you—one of the gang."

Then there were forty-two applicants for the job. Each one had most conclusive reasons why he was the only possible choice. They made an uproar with their disputing, till I said: "Shut up! You are not a lot of old squaws. You talk too much. We'll settle this another way. What fellow here can lick all the others?"

This evoked a howl of protest. "Ah, that ain't fair. That's Harry Fitch. He's older and bigger and stronger."

"Well," I said, "if Fitch can lick everyone here, I guess he is the one for chief. But maybe there is some fellow who thinks he can lick Fitch."

Up jumped Jim Butler. He was perfectly willing to take a chance on it and said he could lick Fitch. I said: "Good! Glad to know where you live. We won't try it now, but we may have to do it some other time."

Then I put these two up for popular election. The result was an overwhelming majority for Fitch. He was undoubtedly their leader—a big, strong, bold, audacious, courageous, athletic boy of fifteen, but stronger than some grown men, full of life and energy, a veritable dare-devil. All the neighbors said he was within measurable distance of the penitentiary with his endless wild pranks.

I was afraid of that boy. I knew that his influence was very bad and his character was strong. He was the leader of the gang, by virtue of his divine right and his equally celestial left. He, in-

deed, it was who painted my gate, but I did not bring up that subject.

When I found that the boys were bound to have him as the chief, I got him off as soon as possible by himself and talked to him. I said: "Now, see here, Harry. These boys have elected you chief of this tribe. That is not simply for today and tomorrow and the next day. We are going to keep this going as long as the fellows take any interest in it. That means that you are going to lead all those little kids. Now, I hope you are too much of a man to get them into serious trouble. Just realize that you are their leader."

He protested in boy fashion that he "wouldn't do nuthin' wrong. He wouldn't do anything bad." Which might mean anything or nothing. I found out later from his mother that it meant a great deal, because it was the first time he had been treated as a person of importance and distinction, and the taste of it was good—it was tonic—it braced him up to meet the responsibility and proved a turning point in his life. That, however, came out long afterwards.

Now, we got Butler in as second chief, then picked a third chief and eight councillors, and I got myself in as medicine man.

Then I proceeded to play Moses. I gave them our ten commandments. In those ten laws, I set forth the things I wished them to do that were not adequately covered by the law of the land.

Which laws with some alterations, continue today as the Law of Woodcraft.

Along these lines, we played the Woodcraft game together till Monday morning came and the boys went back to school, with a wholly reverse attitude towards me. Instead of forty-two little reprobates that the neighbors said were headed for jail, and who were doing all the damage they could to me and mine, I had made forty-two staunch friends, who were bound by and following the Law of Woodcraft. And I have them all today, excepting some who left their bones on the battlefields of France.

Here was a gang of boys getting into serious mischief, solely because they wanted to have some fun. The neighbors called them a bad lot. As it turned out, there was not a bad boy amongst them. The leaders in all their deviltry are fine, outstanding citizens today. Their moving impulse had nothing of the nature of malice, but was simply the exuberant animal desire to frolic. By taking charge of that instinct, I made it a constructive force. Had I taken the other course, one too often followed—that is, called in the police—I should have done more mischief than I could undo in my lifetime. All of those boys continued my active friends. They became my game wardens instead of my poachers. That autumn, a little fellow brought me a cottontail rabbit he had caught, saying shyly: "Say, chief, last summer when I didn' know you, I shot one of your rabbits through the fence, and I've brung this one to take its place."

That was the founding of the earliest Woodcraft tribe of which I personally was the guide. And in different parts of the country in very different walks of life, I meet its members today. Their ample introduction is: "Say, chief, I was one of your boys."

Indirect Vision Telescope

NATURALISTS and hunters especially are interested in a decidedly new type of field glass equipment, the Indirect Vision Telescope, which has been introduced by the Bausch & Lomb Optical Co. of Rochester, N. Y. The instrument permits sight around corners, and it is therefore possible for the observer to conceal himself completely. The use of optical prisms in connection with the lens system means that the objective lenses are placed far out from the eyepiece, so that a person can see around a tree or over the top of a rock or bush. The distance from eyepiece to objective is 14 inches. It is possible to use the telescope in dimly lighted woods, so large is the objective. The magnification is 10 diameters, so that hunters are able to identify definitely game at long range. Naturalists find the telescope of particular advantage in the study of birds and animals. The instrument has an adjustable tripod, so that continued observations can be made without the necessity of holding the glass. A wooden carrying case, for telescope and tripod, is also furnished.

A Wonderful Bird Songster

The Brown Thrasher Likes to Sing
From the Top of the Tallest Tree

By ALVIN M. PETERSON

BROWN THRASHERS are usually to be seen on or near the ground, where they find and destroy thousands of insect pests. How they like to inspect every bush and brush pile when looking for a nesting site or a juicy bite to eat. Down they go into a pile, perhaps near one side, and then, after a few minutes, emerge from it

ABANDONED NEST

Thrashers are very shy and any disturbance during the nesting time is likely to cause the birds to desert their homes in favor of safer and more secluded spots.

near the top or on the opposite side. Down they go for another good look, after which they are ready to go on to another pile or cluster of bushes nearby. When on the ground, they run in and out among the weeds and grasses, finding many dainty morsels on the ground and under leaves. Woe to all beetles, grasshoppers, caterpillars, and spiders chancing to come within sight, for they constitute a goodly proportion of the thrasher's diet.

What a change takes place in his likes and dislikes when he looks for a place from which to sing. Then he hunts the tallest tree and flies to its very top. There he likes to sit and sing to all the world. Who can blame him, when we consider how wonderful his song really is. Why shouldn't he get up high in the air so that his song may be heard at its best? "Look at me, look at me," he begins, and then, after a great outburst of song, he adds, "Can't I sing?" Then on he goes, singing song after song—each one strictly his own—and then, finally, answers his own question by adding, "Whee, you just bet!"

The brown thrasher usually builds its nest in a dense bush or brush pile. The nest shown in the picture was built about a foot from the top of a brush pile. The brush above the discarded nest was removed in order to secure the picture. Note how well the nest matches its surroundings both in color and composition. Large twigs are used for its foundation. Gradually, as the nest nears completion, smaller and smaller twigs are used until tiny rootlets are used for the lining. The nest seems to be but part of a larger structure of which the brush pile is the foundation.

AN ADULT THRASHER

While recovering from an injury this Thrasher was cared for by Mr. Peterson, and very graciously posed for its photograph in return for this bit of human kindness.

Thrashers are very shy birds when nest building and keep out of sight as much as possible. Indeed, you must stay far from the site selected

(CONTINUED ON PAGE 115)

Long Leaf Pine

By Arthur Newton Pack

Here is a story of one of the best known trees in the world. You have heard about it a hundred times, you owe it a tremendous debt, but unless you have traveled south of the once famous Mason and Dixon line you may never have seen the long leaf pine.

THE TALL cowboy of the dime novel is always called "Shorty." Probably the same mental reaction impressed the scientist who named the stately denizen of the southern barrens Pinus palustris, literally swamp pine. Poor tree, it is still the butt of accidental jokes. The seedling grows downward almost before it grows up, putting out a long, tender, sweet taproot which be-

PLUME TO PINE

For the first few years the graceful needles of the young, long leaf pine cling to a straight, unbranched stem. Sometimes these needles attain a length of from twelve to fifteen inches.

FOUND IN A SAND PIT

The sand has been dug away from the base of this long leaf pine stump, uncovering the long tap root, which is characteristic of this species of tree.

comes the eagerly sought objective of every range hog privileged through the usual neglect of its owner to putter about the cut-over forest. Its foot-long graceful needles, clinging at first to a straight and unbranched stem, commend it to the avid decorators of southern hotels who, in the land of the palm, dig and pot the baby long leaf for a place of honor beside the mantel shelf.

The tree grows older. Some forty years of its life have passed since the stage of those early indignities, and now comes the turpentine gang. The axe cuts a V-shaped gouge in the mottled bark of the trunk and the sap trickles out into a cluster of small earthenware cups, encouraged by a periodical scraping of the accumulated resin. Cup to tank, tank to distillery, the gummy material follows its course, emerging at last as pure liquid turpentine ready for the great paint factories of the land, for the makers of printed cloth, the manufacture of rubber articles, medicines and other chemicals. Commercial rosin remains, skimmed off during the refining process, but this too goes to serve mankind in a hundred ways, helping to make soap, ink, linoleum and paper, while the heavier tar oils, once the most sought after prize of all, still appear along the seaboard and wood ship building centers as a caulking material.

But what of the tree whose small notch has now grown with successive chippings to a great and honorable scar? If the tree is to live it must be allowed regular periods of recuperation from the labors of excess sap production, but if maturity has been reached it is right and fair that its wood crop should be gathered in, providing only that the tree's successor shall have been safely started upon its life of useful service. Forestry is not a sermon with "Woodman spare that tree" as its text. Forestry is an acceptance of the immutable law of nature, to use efficiently and well, replacing old age and maturity with productive youth.

The lumberman comes, and long clear logs divide beneath his saws into "yellow pine" lumber, that wood which is now almost the standard of the world. Wood to build our houses, wood to box our food for shipment from the sunny south to bleak winter markets of the north, wood to lay beneath the steel tracks of railroads, build bridges, support wires and guide the bumping ferry boats into wooden slips; in all these purposes and places the long leaf pine is king. And still the story is not told, for branches, slabs and rejected pieces of pine, perhaps lie before you on this page, their wood chewed up in giant digestors for the manufacture of the paper of NATURE MAGAZINE.

A Wonderful Bird Songster

(CONTINUED FROM PAGE 113)

and watch carefully if you want to see them at all while they are at work. Should you chance to get too near the place or make yourself obnoxious in any way before incubation is well under way, the birds are sure to desert their nest and begin looking for another and more secluded place.

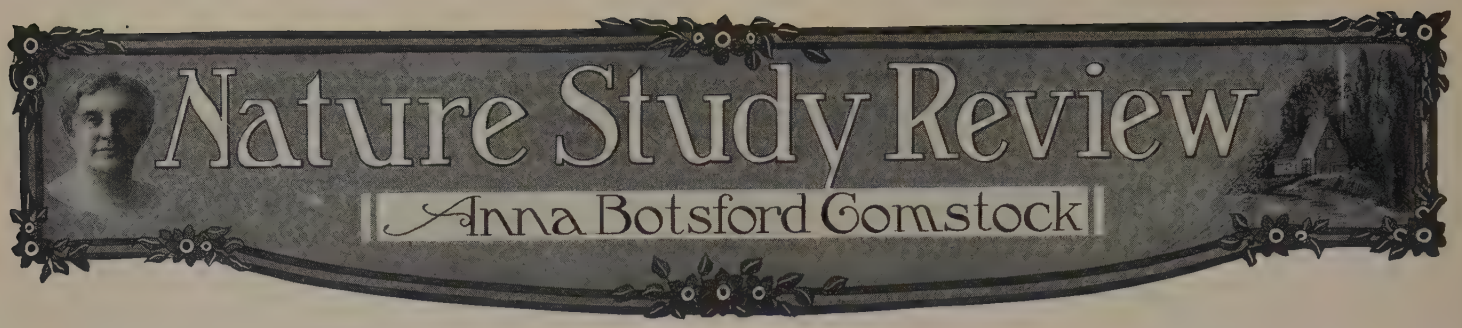
When there are young thrashers in the nest, the parent birds are ever on guard near the place. When intruders get near the nest, they utter a peculiar clicking sound. Occasionally, this is interspersed with a very low whistling sound.

Should you go near the nest when the young birds are nearly grown and soon ready to leave the nest of their own accord, the unexpected is sure to take place. The little fellows watch all your moves, and apparently at some signal, find their legs, wings, and voices at one and the same time, and go off in all directions. There is, in other words, a miniature explosion of young thrashers.

If you try to find the little fellows, you have a big job ahead of you, for generally they can not be found. This is due to the fact that after once out of the nest, they keep on going and do not stop until quite a distance away. There they sit perfectly still, while you, naturally, search the grass where you saw a youngster or two disappear, and do not even get near the places where they are sitting so still. Finally, with the cries of the angry parents—for they can cry out, too, and make a great commotion—you are glad to hurry from the place.

The adult thrasher shown in the second picture, was found injured near a shed and was carried to the yard and left among the oaks. There it fed, gradually regaining its former strength and vigor. Every leaf seemed to be hiding a morsel just suited to its taste. Many a dainty bite was found at the base of some great oak. It did not mind posing for the camera, for it faced it and looked straight at it.

The brown thrasher, as said before, destroys hosts of insect pests. Because of this we are all more or less indebted to it. He is one of our most wonderful bird songsters, his song being varied and rich. This is responsible for the bird's great host of admirers. In addition, his disposition in general is such that all should love him and be glad that in many parts of the country the beautiful brown bird is to be seen in great numbers, to delight the eye and ear.



Back to Nature in the Classroom

GIVEN new impetus by the National Conference on Outdoor Recreation and carried forward by the summer meetings of educators, at which teachers have exchanged many ideas, the Nature Study movement is fast becoming a fact in our educational system. Leaders in educational work have now come to realize the importance of this phase of school work. There is a general appreciation of the intimate relation which the study of the secrets, the marvels and the lessons of Nature bears to all studies and to the preparation for life's work.

Friendship with Nature is not a by-path in education. It is a main highway. It intersects with history, for the gifts of Nature have made nations and modelled civilizations; with geography, for Nature is geography; with economics, for Nature is a basis of economics; and with all of the other courses. It interprets these studies. It humanizes them and makes them play instead of work. The route along this highway has limitless possibilities.

Recognizing these possibilities and the importance of the movement, the President's Outdoor Conference endorsed "Nature Study in schools and the extension of the Nature Study idea to every American school and family." Placing its finger on one of the most important problems in connection with this development, the conference urged that "provision be made in the curricula of all normal schools and colleges for the training of the necessary teachers and leaders in Nature Study."

In other resolutions adopted by the great gathering of those interested in the out-of-doors, similar notes were struck. It was emphasized that the establishment of natural history museums in national parks and others of the people's parks will not only increase the recreation facilities of the parks but will immeasurably increase their educational value. It was brought out, as well, that the future need of an intelligent conservation policy for the United States depends in no small measure upon the background of Nature knowledge among its future citizens.

The conference, in one resolution, declared: "We recognize that the education of school children and popular education through the press and other publications and through churches, colleges and in other ways, offer the surest means to protecting wild plants and flowers." The conference went emphatically on record in commendation of "the work of volunteer organizations which have already exerted much influence and proved the effectiveness of popular education."

One of the committees of the conference was given the task of formulating an educational program for outdoor recreation. This committee advised a threefold educational program, looking to the advertising of existing public facilities and those to be made available in the future, the creation of a proper public appreciation of them and the use of these facilities to the maximum.

"The mere existence of ample physical facilities for outdoor recreation is but a small part of the problem," the committee said. "In our parks and forests the true idea of community ownership, comprehending a desire to maintain and protect, all too often gives way to individual carelessness and destruction. Careless disregard of the rights of others, careless failure to appreciate the coownership of others, must be overcome. Apathy must be built over into an enthusiastic desire properly to enjoy and benefit by public facilities.

"This special educational committee believes, however, that appreciation and love of the outdoors should begin, as with every other form of education, in the public and private schools of the land. New York and California, as examples at either end of our nation, have built up and fostered a greater appreciation of their outdoor facilities through the introduction of Nature Study as a part of their regular school curricula. Thus they have encouraged and stimulated an appreciation of Nature, together with an independence and originality of thought which makes for love of the outdoors and for the foundation of better citizenship."

The Committee on Education Program urged the conference to adopt a resolution endorsing Nature

Study and its extension. This suggestion was adopted by the Resolutions Committee and passed upon unanimously by the whole conference. The committee, in its recommendations, continued:

"This committee equally endorses the splendid Nature Study courses offered by many public libraries, museums and camps, and recommends that all institutions should follow the excellent example already set. It is urged that modern and up-to-date books and magazines on natural history subjects be used, as the advance of science has demonstrated the error of many previous so-called authorities.

"This committee desires to call most favorable attention to the recent movement resulting in the setting aside of special occasions for out-of-door activities or for education along the general line of conservation. At such periods the practice has frequently been to organize competitions among the school children and prizes of nature books or magazines have been offered. The Educational Committee believes that this offers an excellent means of encouraging originality, and marks the study of Nature, not as a compulsory task, but something in itself both recreational and worth while."

This conference, with even the small preliminary work that it was able to do, set up a milestone along the main highway of Nature Study. It recognized it as an essential of the great recreational movement. It hailed it as a fundamental of sound civilization and citizenship. It provided great encouragement and gratification to the members of the American Nature Association, who are dedicated to the furtherance of this work.

What a Young Naturalist Should Do

By VERNON BAILEY

Chief Field Naturalist, U. S. Biological Survey

IF I WERE a boy ready for the high school and wanted to become a real live naturalist I would spend all my spare time nights and holidays and during vacations, making a collection of the mammals, birds, reptiles, amphibians, fishes, and many insects and plants for a school museum, asking the school board to provide moth-proof cases where the specimens could be safely kept under lock and key for the use of the school. Every specimen would be carefully prepared, and neatly labeled, the mammals with cleaned skulls in glass vials, and the stuffed skins arranged in proper order in case drawers. If the school board would not cooperate in providing cases and materials, I would find some way to provide these myself and keep full control of the collection for other use in the future.

However formed, every school should own and have the use of such a museum of local fauna and flora. The mammals and birds should not be mounted but made into flat skins, stuffed to approximately natural size and shape, the reptiles, fishes, frogs, etc., should be preserved in a 4 per cent solution of formaldehyde, the insects properly mounted, and the plants preserved in paper folders. Plans for suitable moth-proof cases can be obtained from any museum or from the Biological Survey of the U. S. Department of Agriculture.

With this training the student collector could enter the biology department of a college or university with a great advantage over most of his fellows, and with a good possibility of getting a position as laboratory instructor or museum assistant, and later other advances in the biology work. The knowledge and skill thus obtained would determine future opportunities for positions and advancement, limited only by one's ability and capacity for work and study.

"The heights by great men won and kept were not attained by sudden flight, but they, while their companions slept, were toiling upward in the night."

Plant Eats Tadpoles

Prof. W. E. Ringle, a naturalist of Pittsburgh, Kans., discovered in a Kansas creek a bladderwort, a plant usually found in more northern streams. He took it to his laboratory and placed it in a jar in which he had placed several thousand very small tadpoles, in order to aerate the water and do away with the necessity of changing it so often. The tadpoles quickly began to disappear in a mysterious manner. An investigation resulted in the surprising discovery that the small balloons of the plant were traps for the tadpoles. The plant had devoured them! If it would consume tadpoles, there is no reason why it should not devour "wiggle-tails," the larvae of the mosquito, Professor Ringle thinks. One way of ridding a community of mosquitoes, therefore, appears to be to propagate the bladderwort in pools and streams.

Nature Study Instruction in Detroit

By MORRISON R. VAN CLEVE

President of American Nature Study Society

THE INCREASING success of the nature study instruction in the schools of Detroit is largely due to two factors: First, the use of platoon organization in the school buildings, which allows provision for special nature rooms and special nature study teachers, and, in the second place, supervision of the instruction by Miss L. Lenore Conover, Supervising Instructor in Biology and Nature Study in the Detroit Teachers' College.

More than a third of the Detroit schools are now organized as platoon schools and in each of them there is a nature room, well equipped, and one or more special teachers of nature study, who give all of their time to this subject. The future building plans of the Detroit Board of Education call for platoon elementary schools, in each of which is to be included a well-planned nature room, including a small conservatory, in which the children learn how to grow plants from seed, cuttings and bulbs, and how to care for plants. The accompanying photograph shows the nature study room in the Barstow school. From personal experience the writer knows that the photographer called these children away from some very enthusiastic pupil activity in order to ask them to pose for their photographs. That is just like a photographer. The Detroit schools now have sixty-six rooms more or less like this one. One can see that such a situation is as near ideal for nature instruction as possible under roof. The only better thing would be class instruction in the field.

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NATURE STUDY CLASS IN A DETROIT PUBLIC SCHOOL

Instruction is given for thirty minutes daily in the first two grades, and about half of this time in the third grade.

Ivy Poisoning: Treatment and Cure

By HARRY NELSON JENNETT, M.D.

"WHAT is the matter with your face and hands?"

"It's poison ivy."

While this conveys the idea, it is not "strictly" correct since the "breaking out," the inflammation, produced by the oil of poison ivy getting on the skin is not a "poison." The nature of the oil is unknown. We know that it irritates the skin and this irritation spreads rapidly, becoming an inflammation of the skin which is known as a dermatitis.

Persons who cut cane often suffer from a cane dermatitis. Cotton seed produces a dermatitis in some susceptible individuals. The lacquer on Mah Jong sets, and some drugs, as iodine, applied and covered, or coal oil, the primrose, the poison oak, satinwood in workers in this fine grained wood used in cabinet making, the vanilla bean—all of these may produce dermatitis.

The first thing to do for this rather large class of skin irritants is to cleanse all exposed skin surface as soon as practicable to get rid of as much of the irritant as possible. This is especially true of "ivy poisoning"—to wash the parts thoroughly, but gently, with soap, water and soft sponge (soft cloth), then to rinse off the soap and to dry gently with a clean soft (worn) towel. Alcohol at first washing removes the oil very well, but in some cases is rather too painful. Too much washing is unwise as it may increase the trouble.

"Ivy poisoning" can be cured rather quickly if it is taken in hand early and the treatment continued.

As soon, then, as one "takes on" said poisoning, systematic treatment should be started. The old common remedy, sugar of lead, is still an approved remedy, though it is a remedy the use of which is ever fraught with some danger. But, while sugar of lead is not the best remedy nor always foolproof, it will surely cure "ivy poisoning" if used properly. It should be applied freely but not too often; it should not be bound on to the affected parts.

As to the more common cures commonly broadcasted for "poison ivy" the trouble usually is that the second day a given remedy seems not to be a cure; then in the course of three days' treatment remedies may have been changed as many times, and the knack of applying never yet acquired. (A liquid having a powder in it, applied with cotton is certainly a good way to filter out the powder and apply the liquid.)

The following is a safe and reliable treatment in average hands, and will cure "ivy poisoning" in three to five days if the explicit directions are followed:

Rx	Quinine sulphate,	drams i ½
	Witch-hazel,	f ounces i
	Glycerine,	f drams iii
	Water, or rose water—qs—f ounces iv	

Only this and nothing more. Mix and apply as directed.

The following directions are essential: Wash the parts once or at most twice a day, with soap and water as directed above. Water is the finest thing I know to convert an ivy poison dermatitis into an eczema, therefore do not bathe too often. As soon as the daily cleansing wash is over and the skin dried, apply the quinine mixture.

Apply the above lotion every hour or oftener when possible, except for sleeping. Do not apply on cotton or cloths; apply to the skin! Pour out a small quantity in a saucer and apply by "patting" it on gently with the fingers until the parts are "soaked." Put applications on over the previous ones. Extend treatment quickly to any new areas.

Do not scratch. The lotion will soothe and stop the itching and burning. Do not stop treatment at the first relief from discomfort.

The days of treatment should be spent at home doing nothing else, that the treatment may be faithfully carried out, the body kept cool as possible, the diet light. Working, sweating, heavy diet and fewer applications a day prolong the case.

Do not waver nor falter during treatment. Keep right on the job.

But if you put the medicine on night and morning, or occasionally, and if you scrub the skin with a brush, doubtless you will, about the third day, change the treatment to some seventh remedy of a seventh son.

Memorial Duck Sanctuary

As a memorial to the late Paul J. Rainey, his sister, Mrs. Grace Rogers, has given 26,000 acres of land in Louisiana to the National Association of Audubon Societies, together with a large endowment to keep it perpetually planted with cereals to furnish winter board for millions of wild ducks. Dr. T. Gilbert Pearson, President of the National Association of Audubon Societies, says that this is the most important step ever taken for the preservation of wild ducks. The land will be sown in sago, wapato, duck potatoes, wild duck millet, widgeon grass, water milfoil, smart weed and other duck food of both the floating and submerged types.

The Rainey Sanctuary, formerly used in part by Mr. Rainey for his own shooting, and now forever freed from the menace of the shotgun, is bounded on the east by the Louisiana State Wild Life Refuge and on the west by the hunting marshes of Edward A. McIlhenny, so recently the object of discussion by bird-lovers and conservationists.

Ranging Pussy-cats

This is the time of year when poor pussy is frequently left by the vacation bound family to shift for herself. Why is it that cat-lovers are sometimes willing to leave pussy behind without any means of care and thus encourage her to learn the delectable taste of baby birds harmlessly nested in the neighborhood? Each year the editor of NATURE MAGAZINE receives about this time a series of protests and tragic accounts of bloody raids by apparently homeless cats. Many of us love pussy, some of us don't, but neither like nor dislike justifies permitting her to run wild among the birds.

How Much Water Will a Tree Drink?

Some trees are always thirsty while some are the camels of the tree world. The United States Forest Service is endeavoring to investigate all degrees of tree thirst by determining just how much water is required to grow six different western conifers up to one foot in height. The young trees will be kept in containers of the type which will permit the measurement of water loss. Thus, the Forest Service will be far better able to select varieties of trees for planting in varying climates.

Something Accomplished

Four measures of interest to conservation were passed at the last session of Congress and received the approval of the President. Notably there was the McNary-Clarke Bill, establishing the basis of a national forest policy. A second measure established a wild life and fish refuge on the upper Mississippi, appropriating $1,500,000 for this purpose. Under a third act the administration of game in Alaska was transferred from the Interior Department to the Department of Agriculture, and the fourth important measure was the act against oil pollution of streams, designed to protect fish life.

Of Interest to the "Fish Fan"

Lovers of little fishes and experimenters with home aquaria will be happy to learn that the New York Aquarium expects soon to make final plans for the long-delayed exhibit of aquatic midgets.

Nothing like it will ever have been seen anywhere, for, besides a larger variety of the bizarre goldfishes and tiny tropicals now found only in the collections of fish fanciers, pigmy fishes native to the fresh and salt waters of the United States will also be shown, as well as larval salamanders and other amphibians, snails and other invertebrates, aquatic plants, etc.

Miss Ida M. Mellen, on the staff of officers for the past eight years, and author of "Fishes in the Home" and various other publications on aquatic life, will assume the curatorship of this unusual exhibit, and will give free advice to teachers and others interested in the care of the small aquatic animals in captivity.

A Porcupine Bill of Fare

Director G. A. Pearson, of the Southwestern Forest Experiment Station, has obtained convincing proof by means of several captive porcupines that pine bark is the favored tidbit of these prickly creatures. He tried them on potatoes, carrots, apples, turnips and salt pork, but Porky would leave any one of them for a chance to gnaw some pine bark. Carrots, however, ran a close second on the list of delicacies.

Wet Weather—Sick Sycamores

Sycamore trees all over the eastern part of the country have been looking woefully miserable and unsightly. They have been going through their annual attack of the "measles," or what corresponds to that ailment in the sycamore family, according to W. A. McCubbin, of the Pennsylvania State Department of Agriculture. The leaves and twigs appeared to turn brown and die, so that some trees look as if they had been scourged by fire. This is a fungus disease confined to sycamore, white oak and a few other forest trees and its attack is always more pronounced during cool moist weather. Many persons, observing this blight, believe the tree is doomed; so it might be if it were an apple tree, but to the sycamore this is an old story. Old specimens have passed through this disease ever since Columbus came to America. When hot and dry weather comes again, the tree will put out new leaves and twigs as if nothing had happened.

Conservation Plank

The Democratic Party, at its national convention in New York durin June, adopted the following plank:

"The conservation of migratory birds, the establishment of game preserves and the protection and conservation of wild life are of importance to agriculturists as well as sportsmen.

"Our disappearing natural resource of timber calls for a national policy of reforestation."

Similar declaration was made in the Republican convention in Cleveland.

Robin Kills a Lizard

On June 6, a group with a nature guide in the Yosemite, witnessed a remarkable performance by a male robin and a five inch western fence lizard. When first seen, the robin held in his beak a writhing thing whose struggles threatened to overthrow the bird. Close approach revealed the prey to be a western fence lizard. Not at all perturbed by the presence of fifteen wondering humans, the robin devoted his entire attention to his catch. Frequently the little reptile would twist into a position to seize upon the bird's throat feathers, whereupon he would gain his freedom momentarily, for the robin would hop a foot into the air and release him. But the attack was well planned, the spot was sandy and open, and, before the freed lizard could race to cover, the bird would again be upon him. It was apparent that the adversary was enjoying the excitement; it really appeared that there were more escapes and captures than were actually necessary. While the lizard was held in the robin's beak, he suffered heavy thumps against the ground and at last he ceased to struggle viciously. The robin ended his existence with heavy, direct blows from his beak and when last seen was engaged in opening the abdominal cavity and pulling forth the lizard's intestines.

The Song of the Water Ouzel

Fishermen and explorers along the Yosemite streams are occasionally favored by the song of the bird made famous by John Muir—the water ouzel. Such a singer was located on a boulder in the Merced River below Pohono Bridge on June 8. With feathers fluffed out he poured forth a wonderful varied song of notes and trills almost to be compared to the sounds of rushing water. To describe this varied song is hopeless.

Although a nest on Tenaya Creek has been watched year after year, no song has been noted. It seems to be common knowledge that the song is more often heard after the nesting season than during it. According to John Muir, this bird often sings persistently in the middle of the winter while foraging alongside of a frozen stream. The person who has learned to use eyes and ears is then rewarded with such melodies as spring from the throat of the water ouzel in mid-summer.

Forest Experiment Station

To determine proper methods of reforestation in the great forests of the Pacific Northwest, the United States Department of Agriculture will establish a forest experiment station in that region on July 1. This station marks the latest addition in the Department's plan to establish forest experiment stations in all the principal forest regions of the United States. Its work will consist of determining proper ways and means to prevent forest destruction either by destructive logging, fire, or other agencies and to insure the perpetuation of the forests as growing crops.

For Bird-banding Workers

For the information of those who are cooperating in the bird-banding work of the Biological Survey, game officials, and others interested in bird life, a new Miscellaneous Circular, No. 18, has been issued by the United States Department of Agriculture. It was prepared by Frederick C. Lincoln, an assistant in this branch of the biological investigations of the bureau, and is entitled "Instructions for Banding Birds."

Bird banding operations are expected to furnish the solution to a number of perplexing problems connected with the habits of migratory birds. How fast, for example, do the individuals of any species travel on their periodic migrations? Do migrating birds make the same stop-overs every year to feed? Do they always follow the same route? How long do birds live? Answers to these and many other important questions will be furnished, in the course of time, from the records of banded birds.

Do Woodchucks Eat Eggs?

The woodchuck is not ordinarily regarded as an enemy of our native bird but apparently once in a while an egg-eater appears in the woodchuck family line. About the middle of May a friend, walking in the woods, heard something fluttering in the bushes nearby and saw a female ruffed grouse fussing about a woodchuck which was at her nest and had a piece of eggshell in its mouth. Another reports on good authority the discovery of a woodchuck who developed a taste for broilers and was finally caught carrying off a half-grown chicken in its mouth. These are, however, rare instances.

Bird Sanctuary

On the outskirts of London, and within half an hour's journey from the city, is one of the most beautiful bits of woodland in England. Few Americans, or Londoners either, have ever visited this place, or even know of its existence.

It is a bird sanctuary, a veritable land of song, which is carefully fenced and guarded by keepers night and day, and where many kinds of British birds live and nest unharmed.

The wood lies in the Brent Valley and was purchased for London two years ago and established as a permanent memorial to Gilbert White, the author of the "History of Selborne," by the Selborne Society of London. The sanctuary, however, has been in existence just twenty-one years this year, and in its nineteen acres, in the boughs of its many oak trees and the coppices of hazel, owls, willow warblers, bluetits, goldfinches, nightingales, blackcaps and many other birds may be seen.

Were it not for this sanctuary, many of the shyer types of birds, the nightingales particularly, would have deserted the ever-growing city of London.

Texas Nature Club Activities

In the public parks, recreation grounds, schools, and close-in woodlands of Houston, Texas, the following sign is being posted:

"Help Make The Outdoors Beautiful; Spare The Wild Flowers and Birds; When Picnicking, Remember to Put Out Your Fires; Clean Up Your Camp; Think of Those Who Follow You.

"Houston Rotary Club."

Local newspapers are cooperating in the campaign, and similar sentiments are flashed before the public from the screens of moving-picture theaters, in street cars, and various other places.

The Outdoor Nature Club of Houston is planning on several campaigns to keep this matter before the public. The members of the club approve of the stand taken by the American Nature Association in regard to the "vermin" extermination drive.

Nature Study by Radio

A series of nature studies is broadcast each week from Pennsylvania State College. Studies of birds, trees, and flowers, animals, insects, and even rock formations are included in these talks.

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The Water That Falls from The Sky

(CONTINUED FROM PAGE 78)

casting. This delusion owes its vitality to the fact that people underestimate the vast amount of energy required to bring about even a moderate shower.

As a matter of fact, man *can* make rain, but every feasible method thus far proposed would, in order to be successful, entail thousands or millions of times as much expense as the results would be worth. Moist air rising over a forest fire sometimes cools sufficiently by expansion to form both clouds and rain—but we cannot afford to burn up our forests in order to break a drought. A mountain, by forcing the ascent of the winds, may rob them of much of their moisture—but no nation is rich enough to build artificial mountains. There are a few other ways in which we could make rain at prohibitive cost, but most of the proposed rain-making processes would not bring results at *any* cost.

The professional "rain-makers" whose operations attract attention during every severe drought are charlatans, pure and simple. Their methods are on a par with those practiced by the rain-wizards of savage tribes, except in one respect—the savage doesn't know any better.

Camping in Palisades State Park

(CONTINUED FROM PAGE 106)

flowers and shrubbery must never be picked. The reason for such selection is explained to the campers. An effort is made to bring the campers and other hikers to see the beauty of the flowers, shrubs, etc., as they are and to leave them in their natural habitat for others to see. An especially interesting feature of this nature study work has been the bringing to the camps various snakes found in the region, giving instruction to the campers as to their habits, etc., letting them handle the harmless ones and teaching them how to distinguish the harmless from the poisonous, of which only two species exist in this region, namely, the copperhead and the rattlesnake. A great deal has been done in this way to overcome in the minds and hearts of campers the innate fear of reptiles, and much good has thereby been accomplished.

Nature study has been specially unique in the camp conducted by the Institution for the Blind, where the blind campers learned to distinguish as many as eighteen trees by feeling their bark and tasting the twigs, as many flowers by their sense of smell and touch, and birds by their notes. Stuffed birds were brought to this camp so that the

campers might feel them and learn to distinguish their size and shape.

Twice during the season exhibitions were held of the work being done at the camps and the museums at this time were particularly interesting. Some camps were especially proud of their display of minerals, others of their aquaria, others of ferns, while nearly all of the exhibitors displayed notebooks of leaves, ferns or wild flowers very carefully mounted and indexed.

But not only in summer is the Park used by the people. During the winter of 1922 the Park was opened for winter campers, other than the Boy Scouts of America, who had already been using some of their buildings during the Christmas and other winter holidays.

Along with the more popular winter sports the study of wild life in winter has been carried on on a small scale and some of the campers have been led on hikes in the woods in search of animal tracks in the snow, whereby stories of their lives and of their encounters with other animals have been told.

Mill or Meadow—Which Shall It Be?

(CONTINUED FROM PAGE 104)

through work which does not interfere with education and which builds instead of destroys. Such questions are being answered by various organizations, led by the National Child Labor Committee.

It is hoped that the members of the American Nature Association will join in the task of making this amendment a success. It is peculiarly their task as conservationists and as lovers of Nature and its works, for it will conserve child life for the future of our country and will introduce many more to the facts of what Nature means and does.

Nature Study in Detroit

(CONTINUED FROM PAGE 118)

In these nature rooms one will find well-kept aquaria, containing water creatures, and about which the eager children are always crowding; growing plants of many sorts, each month in the year; in season plenty of fresh material, brought in from the out-of-doors by enthusiastic children; cupboards well-stocked with excellent exhibits, such as bird skins, insect collections; box cages for live animals. One can see that the lessons are for the most part related to live things, carefully cared for in the nature room.

In these platoon schools instruction in nature study is given for thirty minutes daily in the first two grades and about half of this time in the third grade, and at present experiments are being carried on in this type of instruction in the grades above this. The accompanying cut shows one of these

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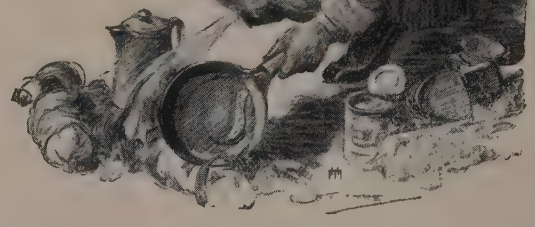

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experimental sixth grade groups in one of the new type nature rooms.

The opportunity of learning the secrets of nature is not restricted to the children in the platoon schools. Some provision is made for nature study in all of the other elementary schools. Many of the Detroit teachers in charge of all the curriculum studies in their respective grades are enthusiastic about utilizing the 60 to 100 minutes weekly which they are permitted for nature study lessons. Hundreds of these teachers attend monthly conferences at which nature study materials and methods of instruction are discussed. In a number of buildings there are teachers who give the nature lessons in several rooms besides their own.

The course of study for the nature work in the first two grades which was recently published by the Detroit Board of Education is one of the best that has been issued in the United States. The lessons are for the most part built upon problems and projects and aim to secure at all times pupil activity. They are arranged by calendar months. A well selected list of teachers' references to factual material and nature literature is given at the end of each section.

Actæon—A White-Tailed Deer

(CONTINUED FROM PAGE 83)

tinguished him instantly from any other Virginia deer.

I called to him in a low voice, and he started and turned his big dark eyes toward me. His ears were bent to catch a repetition of the sound and they caught it, for louder now I spoke his name, and then quietly arose from my hiding place. Instantly he sprang to his feet, white tail in the air and nostrils dilated. He was about to wheel and dash away, when I spoke again and held out my hand to him. He craned his neck inquiringly, his tail dropped and switched nervously from side to side, and then he strode out to meet me. After advancing a few yards he stopped, shook his tail again, moved his head from side to side to make quite sure he was not mistaken, and then he came up and began licking my hands and the sleeve of my shirt. If possible he was more beautiful than ever. He had completely shed his winter coat and stood revealed in his bright red summer pelage, which, being thin, displayed his graceful, sinewy form to its best advantage. His head was clean, smooth and beautifully modelled, with a look of refinement which was not present in the autumn or winter. It was crowned with his first antlers, already six inches long, and with their covering of "velvet" looking like stubby branches of stag-horn sumach.

For a little while he walked about, nibbling the grass and the wild flowers, and then he lay down again. I dropped to the ground beside the little fellow, that I might

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stroke and admire him. In a little while I arose, gave him a pat by way of "good-bye" and started for home. But he did not want to be left alone, and presently I heard the pattering of his feet behind me. He did not stick close to my heels, but stopped when it pleased him, to graze or browse. He never let me get very far away, however. Usually before I was out of his sight he would start after me. If I turned round I would see him coming at an easy gallop, leaping a stream if one lay between us and rising easily at every rock and bush which lay in his path as though he disdained to turn aside for one of them. And when he leaped it seemed as if he were not satisfied with merely clearing an obstacle; he would fling his lithe body far higher than necessary and even give additional emphasis to his abandon by a final toss of his hind legs as if to show that he still had plenty of reserve.

Sometimes, as we descended steep ledges of rock, I could see what appears to be one of the uses of dew claws. Coming down a sharp incline they would connect with the hard surface and, spreading out, would act as a brake which tended to prevent the animal from sliding. Another use of these claws I observed one day when Actæon was racing across level ground which was slippery with mud. In looking at the footprints one could see the marks of the dew claws which had punctured the mud only when the animal was extended and which no doubt at such times performed a service similar to that performed by the spikes in the soles of running shoes. Another means he sometimes used, apparently to prevent himself from slipping on hard surfaces, was to spread his toes before they touched the ground as if to make two points of contact instead of one. I have seen him do this when descending steep, rocky surfaces, stone steps, and on the hard crust of snow. In the last case the spreading of the toes would also tend to prevent the animal from breaking through the crust. Interesting as these observations are to me, they must be verified by other observers before final deductions can be made.

Actæon followed me to the border of the forest, and, after very daintily eating some candy from a paper bag, he turned and disappeared among the trees.

After that we saw the young buck many times. Once was in September, when he left three does and came racing at my call. The last time was in October, when again he had changed his coat, this time to the heavy one of greyish-brown which in certain positions made it very difficult to see him against an autumn hillside. His antlers had now reached the final stage of their growth, the last vestige of "velvet" had disappeared, and they were hard and sharp-pointed. We spent the whole day with him. Toward sundown he wandered from us and we saw him joined by three does—doubtless those we had seen him with before. Together they climbed a little hill,

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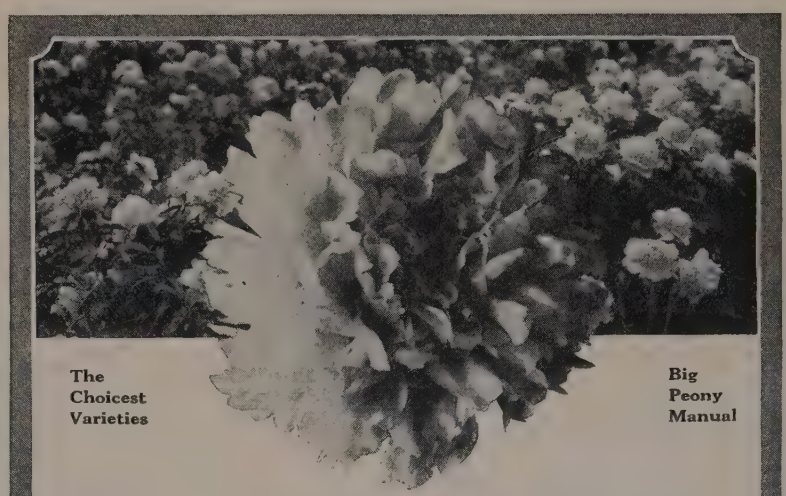

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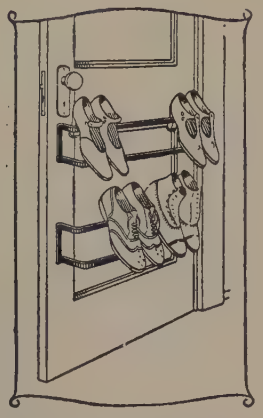

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for a space they moved in silhouette against the reddening western sky, and then one by one they dropped down out of sight into the valley beyond Sunset Ridge.

The Evening Sky in August

(CONTINUED FROM PAGE 90)

yield the palm to ruddy Mars, which is due to rise very shortly in the constellation of Aquarius, over in the southeast. By the middle of August, Mars will be more than twice as bright as Jupiter. On the twenty-second of August, when Mars is opposite to the sun, and on the meridian at midnight, "in opposition" as it is called, it will be at a distance of 34,639,000 miles from the earth. This is closer than it has been to the earth for over one hundred years and closer than it will be again for many years to come. Every fifteen or seventeen years Mars comes very nearly as close as this to the earth, but this month it is coming just about as close to the earth as it ever can come. Many astronomers all over the world are now studying the surface of this little neighbor of ours in space with their telescopes, and this summer, as at other close approaches of Mars, something new may be discovered about the strange markings on its surface, among other things, "the canals" that have been so much talked about in the past. Two years ago a large white spot was discovered on Mars that disappeared within a few days. It was believed to be clouds in the atmosphere of Mars. Similar spots have been observed at other times and many believe that these and some other markings on Mars that change in position and appearance show that there is air, water and vegetation on Mars and so possibly life of some form such as exists on our planet, the earth.

Dragon Flies and Damsel Flies

(CONTINUED FROM PAGE 109)

nymphal period but also on external conditions such as warmth, drought, and so on. After the fifth moult the rudiments of the wings appear as little buds from the ridges of the thorax, and at each subsequent moult they increase in size until they become triangular flaps. Just after a moult a nymph is light in color, either yellowish or greenish, and gradually becomes darker and darker until it moults again. Just after a moult it eats voraciously; then its appetite diminishes until just prior to moulting, when it takes no food.

The chief enemies of dragon fly nymphs are fish, the grass pickerel, yellow perch, common sunfish, bluegill, rock bass, largemouth black bass, calico bass, channel catfish, common catfish and crappie being among those which feed to a considerable extent on these insects. Other animals which feed on these nymphs are the larger aquatic insects, such as the diving beetles, water boatmen, backswimmers, and larger dragon fly nymphs, and also hydra, which

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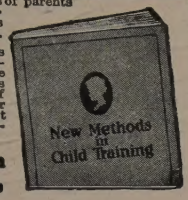

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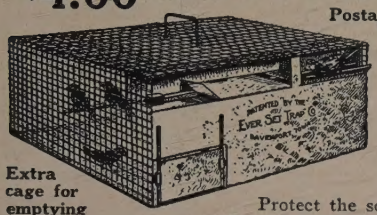

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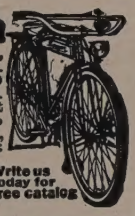

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catches small nymphs with its tentacles.

When the nymph is full grown the wing-pads stand out from the body and the nymph crawls out of the water, usually climbing a reed-stem, stick, or other object, to a height of from a few inches to a yard, though the nymphs of some species merely crawl out on the bank. When the nymph has selected the place for its transformation, it fixes its claws firmly into its support—so firmly that the cast skin remains attached to the support after the adult has emerged. The nymph swells up until the skin splits along the midline of the thorax and head; the thorax bulges out through this slit, and the withdrawal of the head, thorax, legs and wings is gradually accomplished. The insect then hangs head downwards for some time, while the air and sun dry and harden the legs. The wings at first are small, crumpled, greenish or yellowish sacs. As blood is forced into them they are alternately slightly opened and shut. The expansion of the wings takes place with considerable rapidity, about ten minutes being the average time required for this process. When the wings have hardened sufficiently the adult flies away, but for some time—from a few hours to several days, depending on the condition of the weather—the wings, and also the body, are comparatively soft, and the insect's powers of flight are quite limited. Dragon flies in this condition are known as tenerals.

In the majority of species of dragon flies the females leave the vicinity of the water very soon after emerging and do not return until they are ready to mate and lay their eggs, while the males remain near the water. In some species, both sexes remain in the immediate vicinity of water, while in some other species both sexes forsake the ponds and rivers, returning later to mate and oviposit.

The females of those species which deposit their eggs in the water fly over the surface and now and then touch the end of the abdomen to the water, washing off at each dip the eggs. The females of a few species deposit their eggs in the soft tissues of plants growing in the water, cutting a hole for this purpose.

The damsel flies are in many respects very similar in their habits and life-history to the dragon flies. They are not nearly so strong on the wing, and many species have a weak, fluttering flight. They usually keep much more closely to the reeds and rushes, though some species, such as the Black-winged Damsel fly, are frequenters of woodland glades. Some species have two broods in a season.

A large number of species of both dragon flies and damsel flies occur in many localities in North America, some being well marked and thus, once identified, are easily recognized, while others differ from one another by such small, yet constant, characteristics, that only an expert student of the group can distinguish them.

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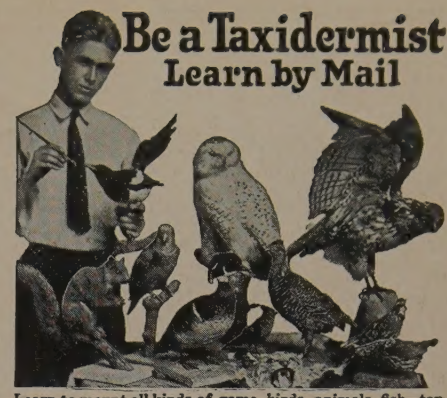

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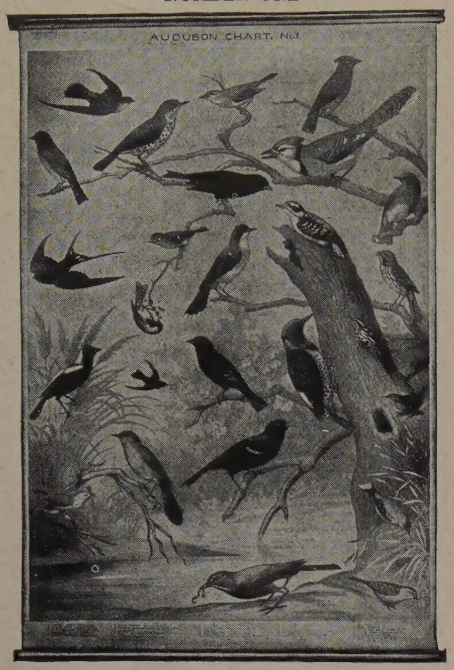

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Kingbird	Downy Woodpecker
Baltimore Oriole	House Wren

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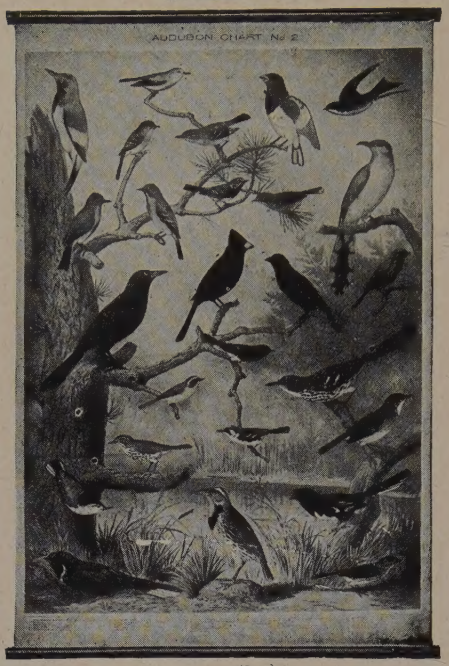

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